

# The Mining Journal,

## RAILWAY AND COMMERCIAL GAZETTE.

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

[The MINING JOURNAL is Registered at the General Post Office as a Newspaper, and for Transmission Abroad.]

No. 2253.—VOL. XLVIII.

London, Saturday, October 26, 1878.

WITH SUPPLEMENT. PRICE SIXPENCE. PER ANNUM, BY POST, £1 4s.

**M**R. JAMES H. CROFTS, STOCK AND SHARE BROKER, AND MINING SHARE DEALER.  
No 1 FINCH LANE, CORNHILL, LONDON, E.C.  
ESTABLISHED 1842.

BUSINESS transacted in all descriptions of MINING Stocks and Shares (British and Foreign), Consols, Banks, Bonds (Foreign and Colonial), Railways, Miscellaneous, Insurance, Assurance, Telegraph, Shipping, Canal, Gas, Water, and Dock Shares.

BUSINESS negotiated in Stocks and Shares not having a general market value.

BUSINESS in COLLIERY and IRON Shares, and in the principal WAGON and MANUFACTURING COMPANIES of the NORTH of ENGLAND and SCOTLAND.

Mr. J. H. CROFTS, having now established CORRESPONDING AGENCIES in all the CHIEF TOWNS of the United Kingdom, is prepared to deal in the various LOCAL Stocks and Shares at close market prices.

ACCOUNTS OPENED FOR THE FORTNIGHTLY SETTLEMENT.

A Daily Price List, issued at 5 P.M., giving latest Quotations up to close of Market, and every Friday a general List containing closing prices of the week.

MINES INSPECTED.

BANKERS: CITY BANK, LONDON; SOUTH CORNWALL BANK, ST. AUSTELL.

SPECIAL DEALINGS in the following, or part:—

25 Bettws y Coed. 25 Flagstaff, 11s.  
50 Chapel House, £3. 25 Pestarena, 4s. 9d.  
50 Chontales, 13s. 6d. 20 Javali, 6s. 6d.  
50 Colorado, £2%. 20 Leadhills, £2.  
10 D'Esrey Consols. 50 Llanrwst.  
20 Eberhardt, 24 ls. 3d. 40 Rookhope, 10s. 6d.  
25 Morfa Du, 14s. 10 Roman Grav., £63%.  
20 East Van, £2%. 25 Pant-y-Mwyn.  
250 Talbot (offer wtd.) 250 Talybont (offer wtd.)

\* SHARES SOLD FOR FORWARD DELIVERY (ONE, TWO, OR THREE MONTHS) ON DEPOSIT OF TWENTY PER CENT.

FOREIGN BONDS.—SPECIAL BUSINESS. Fortnightly Accounts opened on receipt of the usual cover.

JAMES H. CROFTS, 1, FINCH LANE, LONDON.

RAILWAYS—HOME AND FOREIGN.—SPECIAL BUSINESS. Fortnightly Accounts opened on receipt of the usual cover.

JAMES H. CROFTS, 1, FINCH LANE, LONDON.

MISCELLANEOUS AND TRAMWAY SHARES.—SPECIAL BUSINESS in—

MISCELLANEOUS. Royal Aquar. (Westm.) Globe Telegraph.  
Alhambra Palace. ditto Preference. North Metropolitan  
Brighton Aquarium. Lawes Chemical. Tramways.

BUSINESS TRANSACTED in all MISCELLANEOUS SHARES (of whatever description) having LONDON or COUNTRY MARKET VALUES.

JAMES H. CROFTS, 1, FINCH LANE, LONDON.  
BANKERS: City Bank, London; South Cornwall Bank, St. Austell.

ESTABLISHED 1842.

**M**R. W. H. BUMPUS, STOCK AND SHARE BROKER, AND MINING SHARE DEALER,  
44, THREADNEEDLE STREET, LONDON, E.C.  
ESTABLISHED 1867.

BUSINESS transacted in STOCK EXCHANGE SECURITIES and MISCELLANEOUS SHARES of every description.

RAILWAYS, BANKS, FOREIGN and COLONIAL BONDS, TRAMWAYS, TELEGRAPHS, and all the LEADING INVESTMENTS.

Accounts opened for the Fortnightly Settlement.  
A Stock and Share List free on application.

**M**R. BUMPUS has SPECIAL BUSINESS in the undermentioned:—  
10 Aberdantant, 6s. 50 Glenroy, 10s. 6d. 150 Pestarena.  
50 Almada, 6s. 5 Great Laxey, £15%. 15 Roman Grav., £63%.  
50 Blue Tent, £2%. 50 Hultafall, 25s.  
50 Birdseye Creek, 25s. 60 Javali, 7s. 6d.  
50 Colorado, £2%. 50 Leadhills, £2.  
10 Chontales, 12s. 3d. 50 Karpanga, 21s.  
50 Cedar Creek, 4s. 3d. 50 Llanrwst.  
50 Don Pedro, 9s.  
50 East Van, £2 11s. 3d. 50 Marke Valley, 11s. 9d.  
50 Eberhardt, 23 1bs. 61. 50 New Querbrada, 31s 3d.  
50 East Caradon, 6s. 6d. 50 Penstruthal, 4s. 6d.  
50 Flagstaff, 8s. 6d. 50 Panta-y-Mwyn.  
50 Frontino, £2%. 40 Port Phillip, 10s. 6d.  
100 Pandora, 10s. 3d. 50 Roman Grav., 25s.  
100 Pandora, 10s. 3d. 10 West Yre Valley.  
100 Pendruthal, 11s. 3d.

GAS SHARES.—SPECIAL BUSINESS.

BANK SHARES.—SPECIAL BUSINESS.

RAILWAYS.—SPECIAL BUSINESS.

In consequence of the recent heavy depreciation in all classes of Securities, restors may now purchase really sound Stocks at a considerable advantage. BUMPUS undertakes every description of Stock Exchange business, and is in position to give reliable information and advice to intending Investors and others.

SPECIAL BUSINESS, at close prices, in the SHARES of all the principal HOME and FOREIGN MINES.

WILLIAM HENRY BUMPUS, SWORN BROKER.

Offices: 44, Threadneedle Street, London, E.C.

BANKERS—THE NATIONAL PROVINCIAL BANK OF ENGLAND, E.C.

**W**ILLIAM GABBOTT, STOCK AND SHARE DEALER, 8, DRAFER'S GARDENS, LONDON, E.C.

SPECIAL BUSINESS in the following:—  
Chontales, 12s. 10 Isabellae, 50 Port Phillip, 10s. 3d.  
Colorado, £2%. 70 Javali, 7s. 150 Pestarena, 4s. 9d.  
Don Pedro, 8s. 6d. 50 Karpanga, 21s. 15 Richmond, £9 1/2%.  
Eberhardt, £2%. 35 Last Chance, 15s. 20 Sierra Buttes, 36s.  
Frontino, £2%. 50 Plumas, £2 1/2-16ths.

Bankers: The National Provincial Bank of England.

**R**. JOHN B. REYNOLDS, STOCK AND SHARE DEALER, 70 and 71, BISHOPSGATE STREET WITHIN, LONDON, E.C.  
Established Twenty Years.

Bankers: London—City Bank.  
Cornwall—Messrs. Tweedy, Williams, and Co., Redruth.

**R**. GEORGE BUDGE, STOCK AND SHARE DEALER, GRACECHURCH STREET, LONDON, E.C. (Established 28 years)  
ALL BUSINESS TRANSACTED FREE OF ANY CHARGE FOR COMMISSION.

Notice to Investors and Speculators.

BUDGE has SPECIAL DEALINGS in—  
10 Devon Consols, 28s. 50 Monydd Gorddu.  
50 East Caradon, 6s. 3d. 50 Marke Valley, 13s.  
10 East Pool, £8 1/2%. 10 Minera, £7 1/2%.  
100 Exchequer, 6s. 100 London and Call., 8s.  
80 East Chiverton, 6s. 60 North Hendre.  
50 Eberhardt, 23 1bs. 9d. 85 New Zealand, 20s.  
40 Frontino, £2%. 50 Pennant.  
40 Gavton.  
75 General Min., £2 8 9 20 Penstruthal, 4s.  
150 Gold Run, 6s. 6d. 50 Pestarena, 4s. 3d.  
30 Grogwinion, £2%. 50 Penhalls, 14s.  
60 Glenroy, 10s. 6d. 25 Pant-y-Mwyn.  
25 Gorsedd and Merllyn. 50 Panta-y-Mwyn.  
35 Hultafall, 25s. 70 Pandora, 10s. 3d.  
30 Hornachos, £12%. 20 R'd Rock, £2 8s. 9d.  
200 Credit A. 20 Rossa Grande, 1s. 9d.  
20 St. Harmon.  
25 National Dis., £2 8 4 15 West Frances, 22.  
75 I.X.L., 4s. 60 Wheat Ury., £10.  
50 Llanrwst. 25 W. Wye Valley, £2 2 1/2%.  
3 1/2 Isb. 30 Wye Valley, £2 2 1/2%.

SELLERS or SELLERS of any of the above, or holders of any Stocks or Shares

will do well to apply to Mr. BUDGE.

All bargains settled promptly.

**M**ESSRS. PETER WATSON AND CO., 54, OLD BROAD STREET, LONDON, E.C.  
BUSINESS in STOCKS and SHARES.  
RAILWAYS, BANKS, DIVIDEND, LEAD MINES, &c.  
BANKERS: The ALLIANCE BANK (Limited).

A CIRCULAR published MONTHLY. Single copy, 6d.; annually, 5s.

**M** R. ALFRED E. COOKE, STOCK AND SHARE DEALER, 76, OLD BROAD STREET, LONDON, E.C.  
ESTABLISHED 1853.

INVESTMENT or SPECULATIVE BUSINESS EXECUTED PROMPTLY.  
Mr. COOKE's offices are close to the Stock Exchange and Mining Market, being nearer than those of any other advertiser in the MINING JOURNAL.

PURCHASERS of MINING SHARES should avoid heavy risks. The outlay should be spread over different Shares. For selection, subscribe to the "Investors' Gazette."

**L**OWEST PRICES of MINE SHARES may be FOUND in the "INVESTORS' GAZETTE," published every Friday Evening.  
Single number, three stamps; 2s. 6d. quarterly.

ALFRED E. COOKE, STOCK AND SHARE DEALER,

76, OLD BROAD STREET, LONDON.

Established 1853.

**M** R. JAMES STOCKER, STOCKBROKER, 2, CROWN COURT, THREADNEEDLE STREET, LONDON, E.C.  
Mr. STOCKER Transacts Business in all Stock Exchange Securities.

[Established 1848.]

BUSINESS in the FOLLOWING SHARES:—

St. Harmon. Colorado, £6s. 3d.  
South Frances, £4 16s 3d. Don Pedro, 8s.  
East Van, £2 1/2%. Tankerville, £3 16s. Eberhardt, £4 1/2%.  
Glenroy, 10s. 6d. Van, £15 1/2%. Exchequer, 4s. 9d.  
Great Laxey, £15%. West Chiverton, 25s. Flagstaff, 8s. 9d.  
Leadhills, 40s. Commercial Gas.  
Llanrwst. Gas Light and Coke.  
Pandora, 11s. 6d. Imperial Continental.  
Penstruthal, 4s. 6d. Surrey Consumers.  
Panta-y-Mwyn. Eric Reconstruction.  
Pateley Bridge, £3 1/2%. General Credit.  
Roman Grav., 26. Telegraphic Construct.  
Rookhope, 11s. Standard Discount.

BANKERS: LONDON AND WESTMINSTER.

**F**ERDINAND R. KIRK, 5, BIRCHIN LANE, LONDON, E.C.

"THE WEEK."—A SEPARATE EDITION from that which appears in the Mining Journal is published every Wednesday evening, containing "Notes and Hints on the Stock Markets," with Closing Prices. May be had on application.

COLLIERS.—Special Business in Bilsom and Crump, Chapel House, Cardiff, and Newport Abercarn.

MISCELLANEOUS.—Investors should notice the low prices reached by General Credit, Hudson Bay, National Discount, Mercantile Bank, Credit, Brighton Aquarium, and Mexican Railway.

BANKERS: London and Westminster, Lothbury.

**M** R. THOMAS THOMPSON, JUN., STOCK BROKER, 1, PALMERSTON BUILDINGS, BISHOPSGATE STREET, LONDON, E.C.

Mr. THOMPSON transacts business in every species of Stock Exchange and Mining Securities.

Mr. THOMPSON affords reliable information to investors, and can give, when desired, a list of first-class Stocks and Shares, yielding 4 to 10 per cent. dividends upon present prices.—Mr. THOMPSON's weekly Circular may be had on application.

**W**ILLIAMS AND COMPANY, 82, BISHOPSGATE STREET WITHIN, E.C.

Messrs. WILLIAMS AND COMPANY have always FOR SALE Shares in the leading Dividend Mines of the day, and in the most promising progressive properties, particulars and prices of which may be had on application.

SPECIALTIES.

Recommended for present investment—

"PANT-Y-MWYN,"

30 Shares at £3 1/2%.

"LEAD ERA."

This will prove the next great Flintshire prize. Investors will do well to purchase at once—500 SHARES FOR SALE at par. These shares will be certain to command a high premium immediately. Particulars on application.

BANKERS: LONDON JOINT-STOCK.

**M**ESSRS. JONES AND HOUSTON, 25, CROSBY HALL CHAMBERS, LONDON, E.C., can SELL the following SHARES at affixed prices:—

BRITISH MINES.

100 Aberdantant, 4s. 2 Great Grogwinion, £2 1/2%. 35 Rookhope.  
30 Abercarn. 2 Lead Era. 40 Tankerville, £3 16s. 50 Pestarena, £2 1/2%.  
5 Carn Brea, £3 1/2%. 25 Leadhills, £2 1/2%. 5 V. Van, £15.  
25 Hultafall, 25s. 25 Great Holway. 40 W. Wye Valley, £2 1/2%.  
25 Cambrian, £2. 125 North Laxey, off. wtd. 50 W. Wye Valley, £2 1/2%.  
20 Devon Con., offer wtd. 80 Panta-y-Mwyn. 40 W. Wye Valley, £2 1/2%.  
50 Gorsedd, £2 1/2%. 30 Pateley Bridge, £2 1/2%. 30 W. Wye Valley, £2 1/2%.  
100 Gavton, £2 1/2%. 20 Penstruthal, 4s. 6d. 15 W. Tankerville, 11s 3d off. wtd.  
10 Great Laxey, £16. 10 Roman Graves, £6 1/2%. 35 Last Chance, 15s.  
200 Frontino, 11s. 3d. 50 New Querbrada, 31s 3d. 30 W. Wye Valley, £2 1/2%.  
100 Grogwinion, £2 1/2%. 50 Flagstaff, 9s. 50 Pestarena, 6s.  
50 Cape Copper, £2 8 9. x. d. 50 Fortune, £4. 40 Port Phillip, 11s 3d off. wtd.  
100 Chicago Silver, £12 6. 30 Frontino, £2 1/2%. 10 Richmond Con.  
60 Chontales, 12s. 20 Hultafall, 25s. 2 St. John del Rey, £2 25s.  
50 Colorado Uni., £2 1/2%. 50 Pandora, 10s. 6d. 55 L. X. L. Gold, 4s. 3d. 30 York Peninsula.  
50 Don Pedro, 11s. 3d. 20 Kapanga.

FOREIGN MINES.

30 Almada, 7s. 6d. 12 Eberhardt, £4. 35 Last Chance, 15s.  
25 Argentine, 6s. 25 Leadhills, £2 1/2%. 35 Rookhope.  
25 Cape Copper, £2 8 9. x. d. 25 Pandora, 10s. 6d. 35 Great Holway.  
25 Grogwinion, £2 1/2%. 25 Hultafall, 25s. 6d. 35 Pateley Bridge, £2 1/2%.  
25 Cambrian, £2. 100 Exchequer Gold, 6s 3d. 35 Penstruthal, 4s. 6d.  
25 Colorado, £2 1/2%. 30 Leadhills, 25s. 6d. 35 Great Holway, £2 1/2%.  
25 Don Pedro, 10s. 6d. 30 Pandora, 10s. 6d. 35 Pateley Bridge, £2 1/2%.  
25 Eberhardt, 23 1bs. 9d. 30 Rookhope, 10s. 6d. 35 Penstruthal, 4s. 6d.  
25 Frontino, 11s. 3d. 30 Rookhope, 10s. 6d. 35 Pateley Bridge, £2 1/2%.  
25 Gavton, £2 1/2%. 30 Rookhope, 10s. 6d. 35 Penstruthal, 4s. 6d.  
25 Gorsedd, £2 1/2%. 30 Rookhope, 10s. 6d. 35 Pateley Bridge, £2 1/2%.

Special Business in Panta-y-Mwyn Shares as Buyers or Sellers.

Shares marked thus \* will probably have an important rise, and we consider worth speculating in.

BANKERS: London and Provincial.

**M**ESSRS. ENDEAN AND CO., 85, GRACECHURCH STREET, LONDON, E.C., STOCK AND SHARE DEALERS.

Established in 1861.

BANKERS: Barclay, Bevan, and Co., and London and Westminster Bank, Lothbury.

English and Foreign Stocks and Shares and all other Securities dealt in for cash or account.

**L**LANRWST MINE.

Special business in these shares at close prices. Buyers and sellers should communicate with us.

**M** R. W. MARLBOROUGH, STOCK AND SHARE DEALER, 29, BISHOPSGATE STREET, LONDON, E.C. (Established 22 Years), can sell the following SHARES at prices annexed:—

100 Aberdantant, 20 Grogwinion, £2 1/2%. 70 Panta-y-Mwyn, 5s 6d.  
20 Blaen Caclan, £4. 15 Great Holway. 20 Pateley Bridge, £2 1/2%.  
20 Cambrian, £2. 100 Glenroy, 11s. 8d. 25 Leadhills, £2 1/2%.  
25 Colorado, £2 1/2%. 30 Hultafall,

## Lectures on Practical Mining in Germany.

C LAUSTHAL MINING SCHOOL NOTES.\*—No. XCIII.  
BY J. CLARK JEFFERSON, A.R.S.M., WH. SC.,  
Mining Engineer, Wakefield.  
(Formerly Student at the Royal Bergakademie, Clausthal).  
(The Author reserves the right of reproduction.)

## SECTION V.

Before proceeding to consider the lining of shafts by brickwork, masonry, or iron, it will be advisable to discuss some of the preliminary operations to sinking the shafts, the choice of form, position, &c., of shafts, and the sinking operations.

In arranging for the opening out of an untouched mineral field, it will be well to consider, first, whether it will be best for the future development and working of the district to open out the district by means of shafts or levels. When the deposit lies pretty nearly horizontal, and at some considerable depth, and where the surface of the country is comparatively level, we shall have no alternative but to sink shafts in order to get at the mineral. Where the country is of a hilly character we shall be able to dispense more or less with shafts, by driving levels into the side of the hills at or near the bottom of deep valleys. Even in this latter case we may find it more advantageous to open out the deposit by means of shafts rather than levels, since the former will in general open out a deposit more quickly than the latter. Take, for example, the case of a coal seam dipping at an angle of 5°, and that the height which the mouth of the shaft would be above the outcrop of the bed (the mouth of the adit level) at 30 yards, then the relative lengths of the shaft and level (which we suppose driven in the direction of the dip of the bed) to open out the seam at a depth of 100 yards below the outcrop would be—130 yards depth of shaft, and 1150 yards the length of the level. Here it is evident that although coal be worked almost immediately on commencing to drive the level, still since a shaft would allow of the roads being driven in several directions at once, the field would be more rapidly opened out to its full producing power by sinking the shaft, and this would apply still more strongly if the level were driven below the outcrop to intersect several beds. This advantage diminishes as the dip of the bed increases. The most advantageous method would be to drive the level (if in the seam) and sink the shaft at the same time.

In the case of lodes in hilly countries it will almost always be most advantageous to work out the lode by means of successive levels down to the horizon of the deepest adit level, when it becomes necessary to sink shafts from and below the deepest adit level. Such shafts are denominated "deep workings" shafts. These shafts may be necessary on account of the probable exhaustion of the lode before the driving of a deeper adit can be completed, and they must be furnished with pumping and winding apparatus, and offer a travelling road for the miners.

The direction in which a lode dips with regard to the contour of the country may sometimes be decisive as to whether the lode is opened out by means of drifts or shafts. Where the lode dips in the same direction as the side of a long mountain ridge the length of drift, even deep down in the valley, may be comparatively short; whilst if the lode dipped in the opposite direction the intersection of the lode at a considerable depth by a vertical shaft might be effected sooner and more cheaply than by means of a drift.

When it is intended to follow a lode to a considerable distance below the level of the deepest adit, one or more principal shafts will be sunk from the surface, and according to the purpose they are intended to serve may be denominated winding shafts, pumping shafts, travelling shafts, and ventilating shafts. It is more generally the case that the principal shafts serve two or three purposes, and are then divided into corresponding portions or divisions, called "Trummer." Most large mines are provided with both principal and deep workings shafts.

Besides principal and deep workings shafts, the convenience or necessities of transport, ventilation, and drainage cause the sinking of shafts from one level to another. When such a shaft serves principally the purpose of lowering the ore into an underlying level it is denominated a "Röllschacht," when the transport is effected by means of a pulley and braks it is called a "Bremsschacht." It may occur that two lodes run pretty close together, and where one of them is well provided with principal shafts and adits that the other may be worked by a shaft, which is sunk from a cross-cut from the principal shaft or level of the other lode, the shaft terminating there, and not reaching to the surface. In coal mines likewise, where several seams are being worked, it is often more convenient to pull from one level, the seams being connected by the auxiliary shafts from the one to the other, but not reaching to the surface. Such shafts are called "staple" pits, or "blind" shafts.

Analogous to the arrangement of staple and principal shafts is the rarely occurring case of so-called "broken shafts." These are shafts which for a certain distance descend vertically. A slightly inclined or a short horizontal drift leads to a continuation of the shaft vertically downward at some distance from the first vertical portion; this second vertical portion may likewise terminate in a short drift, which may bring the next vertical continuation vertically below, or even at some distance aside from, each of the other two vertical portions. Such "broken" shafts may be found in Japan, each vertical portion being of such a height that a man can conveniently pump the water from the one horizontal drift to the other. These shafts are extremely inconvenient for pumping or winding purposes.

One of the most important questions the mining engineer has to consider is in what part of the district must the shafts be sunk? In the case of metalliferous mines, and where the shaft is intended to be of comparatively small dimensions, and where the lode dips at a very considerable angle, it may be advantageous to sink the shaft on the lode itself. When the lode gets worked out in the upper portion, and it is necessary to sink it further, it sometimes occurs that with a great depth the dip of the lode changes, and the shaft, following the lode, becomes so irregular that it will be found more advantageous for the pumping and winding apparatus to sink a completely new vertical shaft. Not only are shafts sunk on the lode (following the dip), but sometimes in the longitudinal extension of the lode, the shaft having thus an inclined position with respect to the dip line of the lode. Such an arrangement will be useful for following an inclined course of ore in the lode, or for working under water (as under the sea, at Botallack and Wheal Friendship Mines), or for utilising machinery at one end of the lode, or for hauling and pumping from a branch level at the other end of the lode.

In all cases where we have no reliable data as to the ore yielding qualities of a lode at great depths, it is more prudent to commence by following the lode, and afterwards to sink a shaft to cut the lode at a certain depth, and to prolong the shaft beyond the point where it intersects the lode, the shaft both above and below being connected with the lode by means of cross-cuts. Most shafts that are driven on the lode become crooked, and it is evident that the entailed inconvenience and expense may in many cases take away all the profit of the concern. In the South of France in the highly inclined coal seams the shafts were formerly sunk in the seam; the inconvenience thus entailed hindered the drawing arrangements, &c., so much that these shafts have been abandoned, and replaced by vertical shafts sunk through the neighbouring strata.

The advantages of shafts sunk on the lode may be summed up as follows:—1. Since ore may be won from the shaft and the neighbourhood of the shaft, except what is required to be left for a safety pillar during the sinking, the cost of the shaft may be partially or completely covered by the profits.—2. Since the neighbouring or country rock is not cut through less water may be met with.—3. The exploration of the lode can be carried on simultaneously

with the sinking of the shaft.—4. The opening out of the upper part of the lode by levels can be effected in much less time.

The disadvantages are:—1. A greater total length of shaft requires to be driven, according to the dip of the lode, in the proportion of 1 to the sine of the angle of dip of the lode (the inclination of the shaft to the horizon).—2. A greater outlay in fitting up the shaft, as well as a greater amount of material is required, owing to the greater length.—3. In consequence of the irregularity with which many lodes dip, the mechanical arrangements in the shaft for winding, travelling, and pumping are more complicated and expensive, and the efficacy of the apparatus is lowered by such arrangements, which is a point of vital importance where the output per day is considerable; for example, in the coal mines near Creouest, in the South of France, the former method of sinking the shaft in the nearly vertical coal seam itself has lately been discontinued.—4. Inclined shafts are more liable to disturbance, and in order to keep them safe and open entail a greater expense in the timbering.—5. Where several veins run pretty near to each other, and approximately parallel, a safety pillar will have to be left in all the veins near the shaft, and the workings in the other lodes would have to be connected by cross-cuts, and the conveyance of the minerals from all the veins would be less convenient.

With respect to the position of the shaft in the deposit or out of it the following general rule may be stated. Where the capital at disposal is small, and the probable ore bearing depth of the lode not great, and where the district also is only small, and the dip of the lode pretty regular, it will be most advisable to sink the shaft in or on the lode itself; but when the contrary holds good, namely an extensive royalty, ore at great depths, many lodes irregular in their dip, and the capital ample, then the shafts should be sunk vertical in the country rock.

With regard to choosing the position of a vertical shaft, which shall intersect a lode, and serve for opening out the lode, the following considerations may be of importance. The shaft should always be sunk to the dip side of the strike or outcrop of the lode, otherwise the various drifts from the shaft to the lode will be of excessive length. The position of the shaft with regard to the longitudinal extension of the lode will be to a great extent dependant on the surface contour of the country, the existing roads, railways, and other conveniences of transport, and also the estimated ore bearing qualities of the lode in different parts. The distance of the shaft from the outcrop of the lode will depend greatly upon the probable depth to which the lode will be followed. When this depth is known it will be comparatively easy to determine the position of the shaft, in which the total length of the drifts or cross-cuts from the shaft to the lode will be a minimum. This where the cross-cuts are driven at equal distances apart, is that position in which the shaft when sunk perpendicularly will cut the lode at half the depth to which it is intended to follow it.

Suppose two vertical shafts were sunk to work the same lode, one sunk from a place in the outcrop, and the other sunk in such a position as to intersect the lode at half the depth to which it is intended to work it; and suppose, moreover, that there were an equal number of cross-cuts driven (at equal distances apart) from both shafts to intersect the lode, then the total length of those driven from the shaft sunk vertically from the outcrop, would amount to just double the total length of those driven from the shaft which intersected the lode at half the depth of the shaft. If the vertical shaft were sunk outside the outcrop, so as not to intersect the lode at all, then the total length of each drift or cross-cut would be longer by the distance between the outcrop and the mouth of the shaft than they would be if the shaft were sunk perpendicularly from the outcrop. The distance of the position of the shaft from the outcrop of the lode (which must be measured at right angles to the strike of the lode and on the dip side of the lode), in order that the shaft shall intersect the lode at half its depth, is given in the following formula:—

$$S = \frac{d}{\cot \alpha}$$

where  $\alpha$  represents the inclination of the lode to the horizon (is the dip),  $S$  the total depth of the shaft, and  $d$  the distance of the mouth of the shaft from the outcrop of the lode. Where there are several lodes or seams of coal the centre line of the outcrops of all the lodes must be taken as the outcrop in question when using the above formula.

## COAL FIELD OF THE STORMBERGEN, SOUTH AFRICA.

BY FRED. W. NORTH, M.E., F.G.S.

[Read at the South Staffordshire and East Worcestershire Institute of Mining Engineers.]

[Concluded from last week's Journal.]

Amongst these people I found considerable difference of opinion as to the value of the coal upon their farms; some had already made slight openings in it, and were preparing to do more, but these were comparatively few, and they had invariably an exaggerated idea of its value. Some were very apathetic, and cared little about it; others almost ridiculed the thought of working it. One upon whose farm I had previously been and seen the coal, but not its owner, told me that there was no coal upon his "veldt." I assured him there was, and promised to bring him a lump in a day or two. He said, "Oh no, there is none, and if there is it stinks. I like the best meat." Now on this farm we drove headings in a very fair seam of coal, and several others also, at both higher and lower levels. This particular coal is a good one, with a shale roof and floor. I caused a headway to be driven into it for 30 ft., and during that distance it indicated a regular seam, having 2 ft. 9 in. of coal with two parts of shale respectively 5 and 9 in. in thickness, as shown in the section referred to. The quality of the coals is superior to those which have already been alluded to in this neighbourhood. As usual, it still contains a large percentage of ash—certainly 30 per cent., but this is a seam which can be economically worked, and from its regularity a large quantity of it may be found. I took two sections of this coal seam upon this farm at about two miles from each other. One proved in the heading is a very fair seam, much above the average, and the other in a little pit on the right hand side of the road from Burghersdorp to (and about 300 yards before reaching) the Land Fontein Farmhouse. The next section was taken also upon this farm at the end of a heading driven 10 ft. in a small seam of coal lying in the bed of the Bamboe Berg river, where it runs through this property. The roof of it is a very peculiar deposit of conglomerate sandstone, with fossil trunks and branches of trees, hematite deposits of ironstone and colour, and pebbles of all sizes curiously mingled together.

Mr. Vice, of Molteno, appears to have been the pioneer of the coal trade in South Africa, and as early as 1859 opened up an outcrop, but being unable to make favourable terms with the owner decided to remove the scene of his explorations to some other outcrop, providing he could discover a workable one. The result of his researches was that in 1864 he commenced his colliery, which with variable success he has continued to work up till the present date, and founded the site of the village of Molteno. The average thickness of the coal he is working is 2 ft. 5 in., divided into three bands by 1 ft. 7 in. of shale; it is a very strong coal, and the bulk of it breaks into large cubic lumps, admirably adapted for storing. The percentage of slack is small, and exposure to the weather has but little effect upon it when compared with some of the English locomotive coals. It burns with little smoke, throws off much heat in the furnace, and leaves a compact ash, averaging about 35 per cent. of the whole seam; it may be used for any steam purposes if proper appliances are provided for dealing with the inorganic matters. Mr. Vice's first working was by means of a heading driven from the outcrop, but the quality being indifferent he sank his No. 1 pit, from which he worked for some years. In course of time this pit was stopped, and his present one (No. 2) was sunk down to the coal, and has been supplying the limited demand of the neighbourhood and surrounding towns within 60 miles radius with about 500 tons per annum. Of course the appliances and mode of working to supply so small a demand are of the most primitive character.

The Bushman's Hock Coal Mine has evidently been opened with

energy, and at considerable cost to the owners. It is at the foot of the Stormberg, and workings were commenced in June, 1875, and suspended in December, 1876, but are still open and ready for work. A slight dip inwards, however, and a copious flow of water from the roof rock at various places, cause about 1 ft. or 18 in. of water to cover the greater portion of the floor; but this can easily be overcome by a siphon pump, and should the mine continue to dip the same arrangement will still drain the mine. There is an average of 2 ft. 9 in. of coal over the whole mine, containing about 1 ft. of shale; it has a rock roof like Vice's, and where the coal is in its proper state, and not damaged by proximity to the outcrop, it burns freely, but requires a moderate draught; it contains rather more ash than Vice's, and at present I do not consider it so good, but when the workings have attained a further distance from the outcrop I believe the difference will be very slight, and for all practical purposes they will be the same. I was much interested and took much care in the examination of the whole mine, and believe it will have a good future when Stormberg coal is more in demand. The general character and quality of the workable coals of this district are very similar, but still inferior, to the coals near the Indive river. Most of them are less bituminous, but still make a strong fire in a furnace, and leave a large percentage of ash, certainly averaging 30 per cent., the remains of a lump of coal consumed in the open air being almost as large and nearly the same shape after consumption as before. The following is the analysis of the coal at the Camp Indive river, by Dr. P. Daniel Hahn, of Cape Town:—

Specific gravity	1.587
Carbon	61.021
Hydrogen	3.208
Nitrogen	2.190
Sulphur	0.434
Oxygen	2.178
Ash	30.32
Coke	75.28

In using this coal for locomotive purposes it will be useful to have the engines specially constructed for it; and as the railway engineers of Cape Colony do not contemplate a speed of more than 20 miles per hour, there is little doubt that it may be made of much service for that purpose.

An eminent firm of locomotive engineers say—"We have carefully considered your requirements as to locomotive tank engines, also the analysis of colonial coals, and we think locomotives may be perfectly adopted to their consumption, the great desideratum being that the grate area shall be sufficient to allow for partial stoppage of air from clinker, and also to arrange a system of rocking fire-bars, which, being worked at pleasure by the engineman, may break the clinker, and cause the ashes to fall through the bars. We are confident from the fact that you say the coal has great heating power, and from a careful study of its composition, that you could obtain by this compound arrangement of large area and moveable bars a very satisfactory result."

The following opinion of Mr. A. N. Ella is well worth notice. It was a fair trial with ordinary outcrop coal, and I am indebted to him for the personal attendance and care he gave to the matter:—

"DEAR SIR,—You are aware that we work with a Root's patent water tube boiler and a Tangye's patent horizontal engine. To drive the pump, devil, three washers, and hydro-extractors, and to compensate for back pressure of piston, caused by exhaust blowing below surface to heat water for wool-washing, we required to keep full steam up to the following formula:—1. Pressure in boiler, 85 lbs. per inch, cut off at two-thirds stroke, equal to average 65 lbs. pressure on piston. 2. Stroke, 16 in., 13 revolutions, equal to 346 ft. per minute. 3. Area of piston, 50.25 in. By the ordinary calculation per horse power this indicates 35-horse power, which is what we require to keep going an average day's work at this establishment. On July 31 I fired up with the small coal and breeze, and after kindling with wood used nothing but coal (Mr. Ella usually has wood for fuel). The boiler steamed freely and well, but owing to the superabundance of dust we had unduly to prick the fire, consequently a deal of unconsumable fuel came through the bars. In 8½ hours' work I used 1040 lbs. On the next day, Aug. 1, under similar circumstances and in the same time, I used the whole coal alone, and burned 1321 lbs.; this excess of quantity required I found was due to a clay band of about 3 in. thick, which ran through a large portion of the bigger lumps, and this was weighed with the coal, but passed unconsumed through the fire, and had to be raked out through the furnace door, bringing partially consumed fuel with it. The result in 17 hours' work for a consumption of 2368 lbs. of coal, indicating 35-horse power, or as near as possible 4 lbs. of coal per indicated horse power per hour. Total of ash, dust, and unconsumed fuel and the clay band mentioned, 665 lbs., or 28 per cent.

"Now, as regards relative cost compared with wood. Under similar circumstances, of wood we use half to three parts of a load of dry thin wood for a day's work—2200 lbs. to 2300 lbs., or in round numbers twice as much as required of this coal. Wood costs at present about 12. 2s. 6d. per 2000 lbs.—1 ton of your coal is of the same value to us for our purposes as 2 tons of wood. If you can deliver in Queenstown at 24. 5s. per ton of 2000 lbs., it would be cheaper than wood at 12. 2s. 6d. per 2000 lbs., as the labour of chopping into billets would be saved. A feature worth observing is the very little smoke evolved. Thanking you for the opportunity of making this trial,

Fred. W. North, Esq., Government Mining Engineer, Dordrecht."

Then, again, Mr. F. R. Tennant, of Burghersdorp, says—"The coal is the best I have had for my woolwash, and I shall be glad to have three more loads, for which I will pay 37. 10s. per ton of 2000 lbs., delivered in Burghersdorp." The coal sent as a trial to the diamond fields realised 11. 10s. per ton, and was tried in my presence with much success by the Kimberley Mining Board. Under their large boiler it gave great satisfaction, but the cost of delivery is too great to expect a permanent market there. At Aliwal North it realised upon the open market 47. per ton for steam purposes. The proprietors of the Eastern Star, Grahamstown, kindly offered to make a trial of the coal, and for this purpose I sent them 600 lbs. The experiment was made on Aug. 7, and the following certificate of result was given by Dr. Atherstone, Mr. B. J. Glanville, and Mr. John Hayton:—Exactly 100 lbs. of the coal was weighed and the fire lighted, the first shovel of coal being put in at 10.37 A.M. At 11.7 steam was produced; at 11.14 there was a pressure of 10 lbs. of steam; at 11.18 the pressure was 15 lbs.; at 11.19 the first copy of the Star Supplement was printed; at 11.24 there was 26 lbs. of steam; at 11.30, 35 lbs.; at 11.37 with 35 lbs. of steam the engine was throwing off 1600 copies per hour; at 11.14, when there was 10 lbs. of steam, coal was ceased to be added, and the remainder was weighed and found to be 34 lbs., so that the whole of this effect was produced in 42 minutes after the coal was lighted from 68 lbs. of fuel. The water at the beginning was cold. The coal was easily lighted, and burned with a great clear flame; the ash was small in quantity. Several blacksmiths say they can use it, but I do not consider it a good smiths' coal, and do not expect it to compete with English varieties for that purpose. There is, however, one portion of the seam about 5 in. thick, which if selected and kept clean will work fairly in forge. It will never be economically available for ocean steamers, because for that purpose fuel is required in its most condensed form; and, therefore, a coal containing 30 per cent. of ash would require too much space, and would not be sufficiently effective to propel their engines at the speed they are now driven. It is possible, however, that for coasting and steam tugs, &c., where speed is not of so much importance, and for such work where coal can often be shipped, it may be made available, provided that it can be delivered there and sold to successfully compete with the English coals. For this purpose, when a colliery is in full work and sufficient demand can be obtained, I should propose washing all the small broken coal, which is invariably the best of the seam, and adopt the best process for making it into patent fuel; it would then by compression be made into bricks of coal, which can be readily stowed away on board, and have a larger percentage of combustible matter per cubic foot when in the bunkers than if thrown in in its ordinary state.

When so prepared it is quite possible that ocean steamers running

\* Being Notes on a Course of Lectures on Mining, delivered by Herr Bergrat Dr. von Gaudenck, Director of the Royal Bergakademie, Clausthal, The Harz, North Germany.

short of supply would coal with this if other varieties could not be obtained, and in times of war, when the difficulty of obtaining good steam coal will be increased one hundredfold, it will also be in demand. How far ship owners will use it as a mixture, by way of protecting the consumption of their remaining stock of good coal, I am unable to say, but I am of opinion that they could then use about one-fourth of this coal to considerable advantage when mixed with three-fourths of their usual quality. It is not a good house coal, because in an ordinary grate it will not kindle so easily as the better qualities, and as it contains so large a percentage of ash it would be condemned, provided that the better qualities were obtainable. Nevertheless, it burns well, throws off much heat, and gives a cheerful fire; and in a country like the Cape of Good Hope, where fuel is scarce and expensive, it would ultimately be in favour when offered at a sufficiently low rate to defy competition; and to do this I consider the average selling price in Queenstown should be £1.15s. per ton.

With regard to the cost and mode of working these coals. Pit shafts and winding engines will not be required—indeed, it would be well as far as possible to avoid them, because almost all these coal seams, though tolerably dry in themselves, will, in my opinion, invariably have water-bearing strata above them, and after considerable openings have been made the roof and overlying strata will subside, and through the crevices made by the subsidence water—perhaps in large quantities—will flow in, rendering in such cases the addition of plant for pumping, with all its attendant expenses. Levels or headings into the sides of the mountains will always be preferable so long as a good quality of fuel can be obtained from them, because with a slight rise forward the water would flow out. For the roadways driven in the solid coal timber will not be required, but for the working places where the miners will be in some danger from falling coals it will be needed, and I estimate it will cost about 4d. per ton of coals, and is included in my calculation of the cost per ton delivered into trucks.

Probable outlay for a small colliery required to produce 50 tons per day:—

50 iron coal tubs at 100s. ....	£ 250	0	0
Tram rails and wooden sleepers, with nails, &c. ....	100	0	0
Blacksmiths' and sundry other small tools ....	100	0	0
Tub weighing machine ....	35	0	0
Ponies and gearing ....	40	0	0
Apparatus for washing 100 tons of coal per day....	400	0	0
Sundries ....	75	0	0

Total .... £1000 0 0

N.B.—The length of endless chain incline not being known, it cannot be included in this estimate.

Probable cost per ton into railway trucks or wagons for a small colliery of (say) 50 tons per diem. Cost per ton underground:—

Cutting and loading, inclusive of candles, powder and fuse, &c. ....	£0	6	3
Driving headings, stone drifts, and other deadwork. ....	0	0	4
Cost of timber ....	0	0	4
Timbering and drawing out pitwood ....	0	0	2
Labour on underground roads ....	0	0	1
Loading rubbish and other casual underground work	0	0	2
Hauling underground ....	0	0	3
Overtaking ....	0	0	6
Ostler and repairing gearing ....	0	0	1
Total ....	£0	8	2
General charges and costs per ton on surface:—			
Royalty ....	0	0	6
Salaries—Mining engineer ....	0	0	5
Underviewer ....	0	0	5
Clerks, &c. ....	0	0	5
Interest and redemption of capital charged at 12 per cent. per annum ....	0	0	2
Carpenter, smith, striker ....	0	0	5
Mason (occasionally) ....	0	0	1
Weighing and surface hauling ....	0	0	3
Sorting, cleaning, & washing in favourable localities	0	0	6
Loading into trucks or wagons ....	0	0	6
Tab grease, wear & tear of tools, iron, steel, sundries	0	0	8
Total ....	£0	4	4
Total cost per ton. ....	0	12	6

Supposing the Government, with a determination to avail themselves of the fuel, if possible, for railway purposes, prosecute to a successful issue the proofs already commenced, and also ascertain by a series of experiments that the coal will undoubtedly answer for colonial locomotive purposes, then I am of opinion that the following may be accepted as an approximate estimate of the result when compared with the cost upon the present system. Average cost of English locomotive steam coal when loaded up into trucks, as per information supplied by the chief resident engineer at Panmure, 3*s*. per ton:—

English coal free on trucks at East London ....	£3	0	0
Cost of Indive coal per ton ....	£0	12	6
Add 7 <i>s</i> . 6 <i>d</i> . per ton profit available for extension of plant, reserve fund, &c. ....	0	7	6
3000 lbs. of Indive coal will be required to perform same duty as 2000 lbs. of English ditto; therefore, add 1000 lbs. of Indive coal at 20 <i>s</i> . ....	0	10	0

Cost of coal to do same duty as 1 ton of English .... 1 10 0 = 1 10 0

Balance in favour of using Indive coal, less extra cost of delivering 3000 lbs. weight of one against 2000 lbs. of the other for the same effective results .... £1 10 0

Memorandum.—Against this extra cost of delivering the greater bulk it may be taken into consideration that the gradients will be downwards towards the coast for delivering Stormberg coal, and the reverse for any that is imported. Although it is disappointing to find all the coal yet discovered in the Cape Colony persistently divided by bands of shale, and accompanied by not less than 25 per cent. of ash, I am of opinion that it appears, notwithstanding these disadvantages, it may be used economically for railway purposes, owing to the great cost of imported coal, by specially constructing engines for that purpose. With regard to quality, the coal of the Dordrecht district is superior to that of the Moltene, though some of the latter is nearly equal to the best of the former. Upon this fact I have founded a theory that I think will prove to be the rule—that any workable coal will improve in quality in a north-eastern direction. Close observation convinces me that these coal seams are erratic, and not as regular either in thickness or in quality as those found in the carboniferous series of England. Therefore, no estate must be considered to contain the coal seams all over it unless sufficient proof has been made on various sides. At the workings opened in these coals extra care will be required to keep them free from the shale and dirt; this care will render the output of the mines a valuable fuel for all steam purposes at a comparatively moderate price. It must, however, be understood that the present means of transport by bullock-wagon is in my opinion utterly unfit for the economical removal of such heavy produce, and the stores of this fuel in the Stormberg cannot be made available until rail-way extension has opened up this coal field.

A vote of thanks was accorded Mr. North with acclamations, to which he responded.

HEATING AND MELTING METALS.—The fuel, according to the invention of Mr. J. T. SHELDON, of Wolverhampton, is charged into one or more retorts, having their back ends, which are open, connected to the ordinary furnace grate. Air flues are arranged along parts of the furnace and main flue therefrom. Cold air passes through the said air flues (in which it is heated) to flues formed around the retorts. The air on reaching the retorts is at a high temperature, and thus heats the fuel in the retorts, from which gas is consequently discharged into the furnace grates. Openings are formed from the

flues around the retorts into the furnace grate, and the hot air thus meets the gas as it is discharged from the retorts, and a thorough combustion is obtained. When as much gas as is practicable is expelled from the fuel in a retort, the fuel is pushed from the retort into the furnace grate, and fresh fuel is charged into the retort. The furnace is got up by lighting a fire in the furnace grate, and also in the retorts, air being allowed to pass into the retorts until the heat is got up. In the application of this invention to a puddling-furnace the retorts are placed at the end of the furnace grate, and in a position inclining downwards thereto. The main flue from the furnace is formed as a culvert underneath the furnace, the chimney being carried over the retorts. The productions of combustion pass from the underground flue up a vertical flue at each side of the retorts, and thence through cross flues over the arch of the retort bed into the chimney. The air flues are arranged in the bottom of the main flue underneath the furnace, and pass from thence through the back of the furnace to the flues around the retorts. In the case of puddling-furnaces having the chimney in the usual position, the air flues may surround the lower part of the chimney, and pass from thence through the back of the furnace to the flues around the retorts.

#### ECONOMIC MANUFACTURE OF ZINC. THE PROFITABLE TREATMENT OF MIXED BLENDÉ AND GALENA ORES MADE EASY.

The zinc ores usually sold may be divided into two great classes—the sulphides and the oxides. In nature the sulphides of zinc are seldom met with alone, being almost invariably associated with the sulphides of other metals—lead, iron, copper, &c.—galena generally predominating. The separation of the two sulphides—blendé and galena—can generally be pretty readily effected, owing to the difference of density, but sometimes very refractory minerals of this class are met with. As the mines of Belgium have proved inadequate to the supply of the smelting-works of the country, and also in anticipation of the exhaustion of the deposits at present being worked, and of the constantly increasing development of the industry, recourse has been had to foreign countries, and explorations have been made in France, Germany, Spain, and Italy, especially in the Island of Sardinia. In this latter country several mines which have been opened and set to work have not fulfilled the expectations entertained of them—not that they are poor, far from it; but owing to another cause not suspected—the extreme difficulty of separating the two sulphides, and this difficulty has even led to the temporary suspension of the works. It is for this reason that several veins, well defined, of good produce, laid open for a considerable length, of unusual thickness, and rich in silver, have remained unproductive. In most of them the ore is composed of blendé and galena, with a little serpentine; but the two sulphides are so intimately associated that their separation has proved an insurmountable difficulty. It is very easy after fine crushing and careful classification to separate some of the galena and some of the blendé; but there always remain intermediate products forming the larger part of the mixture, and which, however, carefully crushed and prepared, have remained inseparable. The numerous apparatus, even the most perfect, have in turn been tried in the principal establishments (Sardo-Brige, Membach, and others); but, notwithstanding the most careful attention of the most experienced engineers, the efforts have not been crowned with success. Indeed, these intermediary products, although rich in metals, must be considered valueless, because all that can be done is to concentrate them up to about 50 or 55 per cent. of lead and zinc combined, the proportion of zinc being always greater than that of lead. Consequently, these cannot be sold as lead ores, because they contain too little of that metal, and they cannot be sold as zinc ores, because they are too poor; moreover, upon treating the mixture the presence of lead causes the breakage of too many crucibles to render the reduction profitable if the mixed ores be purchased at a price which would leave a profit upon raising them. These mixed ores are regarded in lead and zinc works much as the ologistic iron ores were formerly regarded in the blast furnace.

And these observations do not apply alone to the ores of Sardinia, for recently similar difficulty has been met with in treating Spanish plumbiferous calamine, in which the lead appears to have given rise to the formation of double silicate, which removes all hope of separation by mechanical means. The last report of the Société de la Vieille-Montagne records an analogous fact in speaking of the calamine deposits at Hammam, in Algeria, worked by that company, and minerals from various other sources present the same difficulties. Indeed, it may be said that in most cases it is only after laborious process that even a part of the metals contained can be utilised. If the ores be rich they can to a certain point bear the cost of frequent manipulation, but it is not the less true that so large a part of the value of the mineral treated is thus consumed that very little profit remains. It should be mentioned, however, that at the Breinigerberg Mines, near Stolberg, a mixture of various sulphides has been for several years past successfully treated by first roasting them, and then subjecting them to mechanical treatment. This process has since been adopted at other mines; but this is where special circumstances exist, and where there is nothing in common with the generality of cases, as the cost of treatment is always high, without reckoning the loss inseparable from the several manipulations. Many other examples of the production of these valueless mixed minerals might be referred to, for they are but too well known in Tuscany, the Tyrol, England, Sweden, Norway, and elsewhere; but it would be useless to extend the list to show the importance of such a question, as the manufacture of zinc, which has been so long studied, and which so far as its production from mixed minerals is concerned has received so much attention during the past ten years. Zinc being a fusible and volatile metal readily oxidising in the air under both conditions, and, moreover, the point of volatilisation being very close to the fusing point, it is necessary in practice to take the greatest care to prevent loss. The reduction of zinc ores, then, to the state of oxide if they be sulphurated must be carried on out of contact with air—that is to say, in a closed vessel. Two kinds of reduction processes have been put in practice—the one *per ascensum*, the other *per descensum*: the latter, formerly used in Carinthia, has been abandoned, or but little extended, so that at present the former is alone in operation. In the process *per ascensum* there are two systems of furnace in use—the Belgian and the Silesian—which differ from each other only in the form and number of the retorts used.

Appreciating the advantage which would result from the direct treatment of zinc ores as compared with their reduction in retorts, Messrs. Lencauzet and Müller, in 1860, constructed a blast-furnace for the direct treatment of Belgian ores of little value (worth about 5 fr. per ton, and containing 30 per cent. of iron and from 15 to 20 per cent. of zinc); but as these minerals became unobtainable the treatment of richer minerals gave but unsatisfactory results, because they could only be made to yield zinc grey or zinc dust. There was, indeed, nothing very surprising in this, considering the avidity with which zinc combines with oxygen, and the impracticality of preventing the admission of air into the blast furnace. It was finally concluded that the treatment of zinc ores in the blast-furnace was not practicable; though this has not prevented attempts being made for some years past in America to revive the idea—the inventor sought to reduce the zinc from the ore, then to oxidise it, and pass the oxide resulting over a bed of highly-heated fuel so as to reduce it, and be enabled to run the condensed metal out of the furnace. The process was not successful. Before this new process had come to the knowledge of Messrs. Binon and Grandfils,\* they had been making experiments with the same object, but in a different manner. After having long studied what could be done with these mixed minerals they arrived at the conclusion that, the produce of zinc being small and the produce of lead being also small, it was necessary, in order to treat them to advantage, to extract at one and the same operation the two metals which they contained. This problem being thus put they conceived the idea of rever-

beratory furnace, rectangular in form, with two working doors opposite to each other on the short faces of the furnace, whilst the hearth was on one of the long faces, and the escape of gas takes place through two flues on the other face. Each flue was continued into a square chimney, closed at the upper part and divided, by a refractory partition extending upward a certain distance, into two compartments, one of which, forming the immediate continuation of the flues, is intended for receiving coke to the height of two or three metres, the other intended to remain empty. The gas passing from the furnace through the two flues had to rise through the coke in order to descend the adjacent compartment, and thus reach the chimney. The furnace being thus arranged the intention of Messrs. Binon and Grandfils was to charge on to the sole of the reverberatory furnace heated by a flame, rather reducing than oxidising a mixture of the roasted mixed minerals with a pretty large proportion of coal to reduce the oxides. The zinc once reduced and under the high temperature of the furnace ought to volatilise; but in the presence of the excess of air and of the carbonic acid coming from the products of combustion is transformed into oxide of zinc, which, carried onward with the gas from the hearth, can be reduced as well as the other oxidising agents whilst passing through the columns of coke, and deposited in the metallic state in the neighbouring compartment. In this manner, the zinc being isolated from the mixture and reduced after oxidation, the two metals are obtained at the same operation, for the lead will be found molten on the sole of the furnace.

In the course of their trials they took a tube of refractory earth, about 1 metre high and 15 to 16 centimetres internal diameter, the bottom of which was closed and furnished towards the top and bottom with two small necks; the lower of these was joined to a large laboratory muffle, and the upper was furnished with a sheet-iron lengthening piece, intended to serve as a condenser for the zinc. The tube ought to have been entirely exposed to the fire (but this was not done, owing to the neglect of the workman), and at the upper part, going a little beyond the tunnel of the little furnace which they arranged for the purpose, another tube 1*1/2* metres high—this latter being of sheet-iron, and well fitted to the former. Having filled with broken coke this column of nearly 3 metres in height, and closed the top of the upper tube with a sheet-iron cover, in order to make the gas pass through the lengthening piece, they applied heat for several hours, in order that the coke might be thoroughly dried; then taking metallic zinc they placed it in little cupels to introduce them into the muffle; they produced by burning it oxide of zinc, which they endeavoured to reduce by passing it through the refractory tube filled with heated coke; they, however, made several trials, but always without result. Whatever precautions were taken the oxide of zinc went off as soon as produced, and it was found impossible to retain it. And, finally, they were thoroughly convinced that the industrial solution of the question of treating mixed minerals was not to be found in the process which they had elaborated, and that the principle upon which they based it was not applicable. They then turned their attention to Farnham Maxwell's process for their treatment by the wet way. He treats the hot roasted mineral with chloric-hydride, so as to get the zinc, lead, and silver in solution, in order to precipitate the two latter in the metallic state by means of zinc. He thus obtains a solution containing only zinc, which is in turn precipitated in the state of oxide by lime, which gives a pure zinc mineral, the lead and silver having been eliminated. But the practical question is to know the price at which these reactions can be produced; and Messrs. Binon and Grandfils show that 45 fr. worth of zinc are consumed to obtain 40 fr. worth of lead, and all to obtain two distinct treatable products—so that this must be added to the cost of subsequent fusion and reduction without considering that of producing the reactions indicated. And they doubt whether, even when the mixed minerals contain zinc, lead, and silver, there would be any profit, without calculating upon receiving them at a price at which they could scarcely hope to produce them. And when the mixed minerals contain copper the process is still more complicated, as alternate sulphation and chlorination have to be resorted to. Seeing that none of the processes tested offered much chance of success they tried to utilise a little furnace which one of them had designed for the treatment of argentiferous skimmings obtained in leadworks by the desilverisation of lead with zinc, and consisting of a large number of muffles, inclined so as to run out the argentiferous lead towards one face of the furnace, and condense the zinc at the other face. But the fear of breaking too many pots made them hesitate. When speaking to Mr. Alphonse Fétilis, the managing director of the Rhine and Nassau Mines and Smelting Works, as to what they had done at Membach, he expressed the opinion that in zinc furnaces a real and important progress would be made if it could be arranged to charge them through the roof, and to discharge them in a simple manner as possible. After a few trials they arrived at the furnace which will now be described.

[To be concluded in next week's Journal.]

#### THE SEDIMENTARY FORMATIONS OF NEW SOUTH WALES

In connection with the geological literature of New South Wales few names are more widely and honourably known than that of the late Rev. W. B. CLARKE, a new edition of whose *Remarks on the Sedimentary Formations of New South Wales* (Sydney: Thomas Richards. London: Trübner and Co.) has just been issued. The introductory notice to this fourth edition was written June 2, of the present year, and is signed "W. B. C." (quo dicit octogenarius), since which the much respected author has passed away. It will be remembered that the first edition of the work was prepared for the Paris Exhibition of 1867, and in each succeeding edition much new and interesting information has been added. The map of Australia shows that the coasts of Victoria, New South Wales, and Queensland follow the general directions (with some irregularity) of the Cordillera, or elevated land separating the waters flowing directly to the coast from those which draining the interior disengaged to the south-west. The Murray receives some parts of its tributaries from the highlands of Victoria, and others from New South Wales; whilst the Darling and its tributaries collect the remainder of the supply from as far north as 25° south latitude. The Cordillera thus sweeps round in an irregular curve from west to east to the head of the Murray, and thence northerly and north-easterly to the head of the Condamin, trending north-westerly from that point to 21° south, whence it strikes to the north, terminating its course at Cape Melville, in 10° south, about the meridian of Mount Alexander, in Victoria. The more westerly and southerly trend of drainage is represented by the Thomson and Barco rivers, which carry off the waters of the Cordillera at the back of the Barrier Ranges to Spencer's Gulf. Strzelecki in 1845 traced the Cordillera from the southern point of Tasmania to the parallel of 28° in long. 152°, but not further westward than 146° on the parallel of Mount Alexander. But it is doubtful whether the range between this furthest western point and Wilson's promontory, where he considers the chain to be cut off by the sea, forms anything more than a spur in that direction, though passing through Bass's Strait on to Tasmania. But the extent of the Cordillera westerly to its termination on the border of South Australia is so well defined that there can be no question that the southwestern and western extension has as true a character as any part of the northern prolongation. The boundary line separating Victoria from New South Wales crosses very near the highest point of all Australia. The highest point of Kosciusko is found by the more accurate observations of Clarke and Neumayer to be 7175 ft. (not 6500 ft. as Strzelecki calculated) above the sea.

Thus all the enormous drainage of western New South Wales and south-western Queensland is, at it where, bounded by ranges of high geological antiquity, the Grey and Barrier groups being of undoubted similar age to the mass of the eastern Cordillera. It has long been known that the strike of the oldest sedimentary rocks through the Cordillera in Victoria as well as in New South Wales is generally meridional, so that in the former province the beds strike across the Cordillera, whilst in the latter they form various angles from parallelism with it to a transverse direction, as the chain doubles and winds irregularly in its course. It sometimes happens that owing to the high angle of dip and the effect of denudation on the over-

\* Etude sur l'Amélioration des Procédés de Fabrication du Zinc. Par JOS. BINON, ing. clv. à la Société des Mines du Rhin, &c., à Stolberg, et ALPHONSE GRANDFILS, directeur des Usines de Membach. Liège: Vaillant-Carmanne, Rue St. Adalbert.

lying formations, the Cordillera itself becomes in places almost knife-edged, so that in New South Wales it presents occasionally a water-shed not more than nine paces in width, whilst in Manero to the south and in New England in the north it spreads out into a plateau, on which eastern and western waters rise close together, and sometimes overlap. It might naturally be assumed that one order of deposits is to be expected throughout the Cordillera, but there is a singular exception. Whilst marine deposits of tertiary age are found along the west coast of Australia and along the southern coast from Cape Leeuwin to Cape Howe, there are no known marine tertiary in any part of the coast of New South Wales and Queensland up to the Cape York peninsula, and the reason of this may be that, as indicated by phenomena before pointed out by Mr. Clarke, the eastern extension of Australia has been probably cut off by a general sinking, in accordance with the Barrier Reef theory of Mr. Darwin. This has some support from the fact that there is a repetition of the Australian formations in the Louisiade archipelago, New Caledonia, and New Zealand, in the latter of which occur abundant tertiary deposits. The intervening ocean may, therefore, be supposed to cover either great synclinal depression or a denuded series of folds, but, as shown in 1874 by H.M.S. Challenger, this depression is of enormous depth, 2625 fathoms having in one sounding been reached. Relatively speaking, then, the Cordillera of the eastern coast has not been subject to the changes which introduced the relics of a tertiary ocean, or they have been removed by subsequent sinking and denudation.

Very interesting chapters are given on the Azoic or metamorphic rocks, on the lower palaeozoic rocks—the lower and upper silurian, on the middle palaeozoic rocks, on the mesozoic or secondary formations, and on the tertiary rocks; and in these the whole question of the age of the New South Wales coal deposits is fully and carefully discussed, and there can be no question that in dealing with the subject Mr. Clarke has been much more desirous of adhering closely to logical deductions than many of his opponents have shown themselves to be. The whole subject is well worthy of being fairly discussed (for most that has already been said and written has been insufficiently supported by observed facts, which have been ascertained by absolute exploration and research), and the necessary data for the discussion cannot be more readily obtained than from the perusal of Mr. Clarke's volume.

#### MECHANICS OF ENGINEERING.

The reliable character of Prof. Weisbach's treatise on mechanics has long been known to engineers, and the publication of a thoroughly good English translation will certainly cause the study of it to become more general, more especially as copious annotations have been introduced, giving details of American practice in connection with the matters treated of. The second part of the second volume, \* treating of Heat, Steam, and Steam-Engines has just been issued, and leaves nothing to desire. There still remains to be translated the third volume, which completes the course, and which in connection with the other two will furnish technical schools and colleges with a full and thorough mechanical course, well adapted to the wants of students. The entire work has been thoroughly revised, and much has been entirely rewritten, by Prof. Gustav Hermann, of the Royal Polytechnic School of Aix-la-Chapelle, so that when complete all information on the subject will be brought down to the latest and most approved practice.

The present section occupies 560 pages, and has about 500 engravings in the text; it is divided into four chapters. In that on the properties of heat all requisite information is given on the work of vibration, heat conduction, expansion, heat capacity, specific heat of gases, Poisson's law, mechanical equivalent of heat, latent heat, and so on. In the chapter on Steam there are sections on the expansive force and temperature of steam, experiments on the expansive force of steam and the results of these experiments, expansive force and density of vapours in general, and on other cognate matters. The next chapter treats on steam generating apparatus, and refers amongst other things to the different forms of steam-boilers, heating surface, water and steam space, thickness of boiler sides, rivet connections, combustion of smoke, heating by gas, feed apparatus, and safety-valves. And, lastly, the chapter on the steam-engine treats of the expansion and condensation of steam, valve gear, law of motion of the crank, eccentric with variable expansion, expansion slides, Corliss engine, Woolf engine, work of steam without expansion, expansion in two cylinders, exponential law of expansion, application of mechanical theory of heat, indicator diagrams, piston friction, principle of the hot-air engines, gas engines, and various other matters bearing on the question. The work throughout is admirably translated, and as to the completeness and utility of the information given it is sufficient to say that nothing has been omitted though much has been added to Weisbach's original treatise.

#### NEW SUBSTITUTES FOR GOLD AND SILVER—APHTHITE AND SIDERAPHTHITE.

Some very beautiful alloys applicable as substitutes for gold and silver in the manufacture of jewellery and similar purposes have been produced by Messrs. MEIFFREN and Co., of Marseilles. To make an alloy having the appearance and colour of gold they place in a crucible copper as pure as possible, platinum, and tungstic acid in the proportions below stated, and when the metals are completely melted they stir and granulate them by running them into water containing 500 grammes of slaked lime and 500 grammes of carbonate of potash for every cubic meter of water. This mixture dissolved in water has the property of rendering the alloy still purer. They then collect the granulated metal, dry it, and after having remelted in a crucible they add a certain quantity of fine gold in the proportion herein-after specified. An alloy is thus produced, which, when run into ingots, presents the appearance of red gold of the standard 750·1000, and to which may be applied the name of "aphthite," or unalterable. They can change the colour of the alloy by varying the proportions of the different metals. As flux they use boric acid, nitrate of soda, and chloride of sodium previously melted together in equal proportions. The proportion of flux to be employed is 25 grammes per kilogramme of the alloy. The proportions they employ, by preference, for producing an alloy of red gold colour are—copper, 800 grammes; platinum, 25; tungstic acid, 10; and gold, 170 grammes.

The alloy used in imitation of silver consists of iron, 65 parts; nickel, 23 parts; tungsten, 4 parts; aluminum, 5 parts; and copper, 5 parts. The iron and tungsten are melted together, and then granulated, as in the case of the previous alloy, except that in this instance the water into which the mixture is run contains one kilogramme of slaked lime and one kilogramme of carbonate of potash per cubic metre. The nickel, copper, and aluminium are also melted together and granulated by running into water containing the same proportion of lime and potash. Care should be taken during the melting to cover the metals contained in the two crucibles with a flux composed of one part of boric acid to one part of nitrate of potash or nitre. In the crucible containing the aluminium and copper they place a lump of sodium of about two grammes in weight when treating five kilogrammes of the three metals (nickel, copper, and aluminium) together to prevent oxidation of the aluminium, and they also add charcoal to prevent oxidation of the copper. Before granulating the metal in each crucible it should be well stirred with fire-clay stirrer.

The granulated metals are dried, as in the former case, then melted together in the same crucible in the proportions above indicated, and well stirred, after which the alloy is run into ingots. The alloy thus obtained, to which may be given the name of "sideraphthite" (or unchangeable iron) presents the same white appearance as platinum or silver, and is not more expensive than German silver. These improved metallic alloys are capable of resisting the action of

sulphurated hydrogen, are unattacked by vegetable acids, and but slightly attacked by mineral acids; they are also perfectly ductile and malleable.

#### THE SCOTCH MINING SHARE MARKET—WEEKLY REPORT AND LIST OF PRICES.

During the past week there has been no improvement in confidence, and, therefore, with little inclination on the part of buyers to operate, the general tendency of prices has been unfavourable. The selling or lowering of prices in unsuccessful endeavours to sell is in many cases of a forced character, and that is a state of affairs which cannot last very long. It is universally recognised that this is a good opportunity for parties to buy who have the money ready, and it is believed such buyers will gradually take the place of the weaker holders of securities, and after a time it will be found the markets will thus be strengthened, confidence will arise, and a recovery become certain. The extent of the recovery will depend upon the condition and prospects of trade at the same time, but after the clearing of unsound concerns now being made, no apprehension need be felt that trade will not become sound and good.

In shares of coal and iron concerns, Scottish Australian (new) are raised 3s. 9d., and Glasgow Port Washington 2s. 6d.; but Benhar and Bolekow, Vaughan, A., and Scottish Australian both 2s. 6d. The principal dealings have been in Benhars, which have fluctuated between 2s. and 4s. 7s. 6d., and it is supposed they are being realised by parties at the head of affairs, who will have to come forward with the necessary funds to meet the debenture bonds falling due at Martinmas next, or there will be little chance of arranging the debt. A meeting of the Chatterley Company is to be held to-morrow to receive a statement of the position and prospects. It appears the ordinary capital has been expended, and it will either be necessary to raise more to meet the liabilities till trade improves, or wind-up. The half yearly meeting of the Scottish Australian is to be held on Oct. 30, and the report to June 30 shows a net profit of 18,463L. A dividend of 15 per cent. is proposed, payable Nov. 7, to add 3500 to the reserve, making it 21,000L, and to carry forward 29,682L, against 22,542L brought in. The total sales were 99,463 tons, and the sales for August have been 21,265 tons. Bilbao are at 20, Bolekow, Vaughan, A., 55 to 55½; and ditto, B, 35½. Brown, Bayley, and Dixon, 5½ dis. C. Cannell and Co., 10½ dis. Cardiff and Swansea, 26s. Chatterley 23 dis. Chillington, 60s. to 65s. Ebbo Vale, 5½ to 6. Great Western, 45s.; ditto (pref.), 90s.; and ditto (debentures), 62½. John Brown and Co., 13½ dis. Nant-y-Glo and Blaina (pref.), 18 to 20. Newport Abercarnie, 90s. Rhymney, 14½. Sheepbridge 27½ dis. South Wales, 70s. Staveley, A., 5½ prem.; ditto, B, 40s. prem.; and ditto, C, 68. Tredegar, A, 10½; West Mostyn (pref.), 20s.

In shares of foreign copper concerns, Tharsis old shares are raised 5s., while the new shares are 1½ lower. Cape are 21s. and Huntington 6s., both also lower. Tharsis have been steady all the week, the prices varying only from 21½ to 21¾. It is announced that the second half of the dividend of 17½ per cent. declared from the profits of 1877, will be paid on those shares of Nov. 8. This dividend amounts to 17. 6d. on the 10½ shares, and 12s. 3d. on the 7½ paid issue. The annual meeting of the Paulicello Company is on Nov. 1, and the report to June 30 shows a loss of 3433L, the greater part of which was made in the first six months. Since then considerable economies have been inaugurated in the smelting expenditure, and the reserves in sight are estimated at two years' consumption. The debenture debt stands at 48,000L. The usual monthly advices from Yorke Peninsula are remarkably good. In regard to the ore returns, other 1½ tons of 19 per cent. have been shipped, and there were on hand 171 tons of 17 per cent. and 800 tons of dredge ore of about 8 per cent. Rio Tinto 5 per cent. are at 66½; Yorke Peninsula, 3s. 9d. to 5s.

In shares of home mines the rise of 2s. per ton in tin has made shares in some of the leading mines more marketable, such as South Condurrow, South Frances, Dolcoath, Tintoret, North Busy, and a few others, but most of the others continue to be freely offered, the prospects of calls keeping back buyers.

Shares of the principal lead and copper mines are unmarketable. At the Prince of Wales Mine the only hope now is in the silver-lead. The continued decline in Great Laxey is attracting attention, as if anything goes wrong with the leading Manx mine it means people will not care to touch any other set in the island on fair terms.

The sale of the Glasgow Caradon Company on the 17th inst. computed 200 tons copper ore, realised 877. 16s., or an average of fully 87s. 9d. per ton, and compares with the same quantity at 84s. Id. last month, while the October sales for some years back have been—In 1877, 238 tons, at 77s.; in 1876, 245 tons, at 90s. 10d.; in 1875, 215 tons, at 117. 9d.; in 1874, 245 tons, at 102. 1d.; and in 1873, 308 tons at 99s. 5d. This is the company's tenth sale for the current financial year, and the total proceeds of these sales, as compared with the sales in the corresponding period of 1877, show a decrease of 1798L. In August a decrease of 1899L was shown on eight sales in the same way, so it would appear that the depression has now passed its worst and an improvement seen. Cambrian are at 1½ to 2; Devon Consols, 1½; Great Laxey, 15½; Medlyn Moor, ½; Mwyndy, 1½; North Busy, 1½; North Laxey, 1s. 3d.; Roman Gravels, 6; St. Patrick, 9s. 6d.; Wheal Jane, ½; Wheal Uny, 6d.; West Chiverton, 2.

In shares of gold and silver mines, Richmond are unaltered, and have sold from 9s. 11s. 3d. to 10d. during the week. Colorado United gradually fell to 42s. 6d., but are slightly firmer now, and at anything under 2s. might do to buy. Little business has been done in Exchequer. It appears that the whole of the 100,000L issue of new shares in this mine has not been taken, and the closing of the share list is only part of an arrangement previously made, and after this week none are to be issued except at 2s. prem.

As the new shares are only entitled to coupons it is by no means impossible that they may be eventually subscribed by people in the country or foreigner, who are all fond of anything that looks like a lottery. The half yearly meeting of the Javall Company will be on Oct. 28, and the report to June 30 shows that 11,163 tons of ore had been treated, producing 9300L, against 8795 tons and 6402L in the corresponding period of 1877. After meeting interest on debentures it is estimated that a clear profit of 1300L will be made, and this encourages the directors to hope to begin reducing the debenture debt soon, but nothing will be attempted in the meantime as regards the preference shares, interest on which is accumulative. The meeting of the United Mexican Company is to be on Nov. 6. Santa Barbara and New Zealand Kapanga are better on good accounts from these mines, also Pitangul. Notwithstanding considerable expenditure on improvements at both mines, the profits in September at Sierra Buttes of \$11,769 and at Plumas Eureka of \$19,939 are very good. Port Phillip shares are now quoted ex div., and the profit for the month ended August 14 has been 18·2L, and for the month ended Oct. 9, 1304L. It is difficult to understand why such brilliant results are being predicted from a new mine—the Isabelle. From a prospectus issued in June all the information possessed about it simply was that some people the directors knew had inspected it, and said it was a promising investment. Eberhard is at 80s. Einma, 2s. Flugstaff, 8s. 9d. I.X.L., 2s. 6d. to 5s. St. John del Rey, 280. South Aurora, 2s. 6d. to 5s. Tecoma, 3s. United Mexican, 9s. 6d.

In shares of oil companies, Upahall have declined 12s. 6d. and Young's Parafin 6s. 3d. The latter shares have been sold at 13½, but at one time were worth 13s. 16s. 3d. In shares of miscellaneous companies there is little doing. Native Guano are at 75s. Palmer's Shipbuilding, B, 12½ dis., and Phospho-Guano, 8½ to 9. Wagon companies shares are quiet. There has been a great fire at the works of the Gloucester Company, and most of their sheds are burnt. It is said they are fully insured, but operations no doubt will be much curtailed for some time. Bristol and South Wales are at 7½. Swansea, 30s. In chemical companies shares prices are—Lawe's, 8½ to 9; Mangoldale's, 8½. 6d. Newcastle, 45s. 9d., and Northern Agricultural, 10½ to 11.

A CORRECTION.—In last week's report by some mistake a sentence referring to the Huntington Copper and Sulphur Company (as follows) is inserted:

"The effort recently made to stop the action by the shareholders of this company against the original directors and promoters has apparently been of no avail, as a summons has just been served upon each of them for the sum of 150,000L, on the grounds that the company was floated by means of false and fraudulent representations."

Of course anyone aware of the deservedly high standing of the Tharsis Company might at first sight be surprised to have read this, but afterwards could hardly fail to perceive it was some mistake, yet we regret none the less such an unintentional blunder should have occurred, especially regarding a concern about which we have on many occasions written so favourably.

**MINING PROPERTIES.**—The purchase and sale of these properties has quite come to a stop owing to the disorganised state of financial and commercial matters, but sound and valuable sets can now be had at such low prices that this department of business is considered likely to improve soon. The sets in the D'Eresby Mountain district are all being picked up, but it is said a very valuable one, where work has been done, and a mine could be opened up at once with a small outlay, is to be introduced shortly, when fuller particulars of it will be given.

**MINING IN FLINTSHIRE.**—The Prince Patrick Mine, which is be-

ginning to attract attention, paid annual dividends of 25 per cent. up to January, 1876. After that, in consequence of the lode being thrown or heaved, it was lost for nearly 18 months, and has just been discovered again very rich to the north of the workings, and from all that can be seen it promises to be more productive than ever it was.

The last monthly report, given in the Journal of Oct. 12, fully referred to this, and by later information the lode in the 50 north continues to hold good, and never looked better. The mine is, indeed, steadily improving.

Independent of this discovery they have three other points of great promise, which when reached will considerably enhance the value of the mine, and the least improvement in the price of lead ore will, no doubt, send the shares up from their present low price of 25s. to what they were two years ago—70s. to 80s. each.

Investors should secure an interest before the rise takes place. At the Rhyl Alun Mine there is nothing new; here it will be remembered the sales from the new lode above water level have increased from 12 to 40 tons last month. Deep Level Mine continues to look very encouraging. The recent discovery in the Drainage tunnel of ore, continuous for 70 yards, and worth in places from 2½ to 3 tons per fathom, is making these shares very hard to buy. The feed of water tapped is now sufficient to fill a 4-in. pipe, and increasing.

**CLEMENTINA.**—The opinions on this mine are contrary. It is

pointed out no faith can be put in any mine in the district, as they never come to anything good.

On the other hand, some are more sanguine, believing that the gorse lode, which was assigned as the cause of a great rise in D'Eresby Mountain shares, is in this sett, and a course of ore of something like 4 tons per fathom, left by the old workers, can be opened upon as soon as the new large wheel is erected, and the 15 fm. below deep adit drained. The promotion and management are apparently right enough; but as regards the working capital, that is less known about.

**CHEMICAL COMPANIES.**—It is said that parties are being induced to start chemical works in West Cornwall by questionable representations.

There certainly are large quantities of ore burnt in that part of the country which would be capital material for cer-

tain departments of the business; but as for bones, &c., there are many grinders scattered here and there, so that although regularly collected in even the most populous parts, there would not be one-fifth of the material got requisite for one work, and consequently materials require to be largely imported. But there are already several companies, such as the West of England Bone and Manure Company, at Penrhyn, which has been established a quarter of a century, besides several others of later growth. The statements regarding the early vegetable trade are incorrect, as the fertilisers used are seaweed and guano, though the whole of this trade is quite unimportant. In no place in England is manure sold so cheaply as in West Cornwall, on account of the immense competition. The London makers can send it down to the various seaports and creeks as cheaply as the local makers, for the freight in no case exceeds 5s. per ton. In these circumstances it is impossible to see how such an enterprise can succeed.

Subjoined are this week's quotations, &c., of mining and metal shares quoted on the Scotch Stock Exchanges:—

Capital. Dividends. Rate per cent. Description of shares.

Per share	Paid up	Previous	Last	COAL, IRON, STEEL	Last price.
£10	£8	£2	7	Arniston Coal (Limited)	7s.
10	10	4	4	Benhar Coal (Limited)	5s.
100	50	22s. 6d.	31s. 6d.	Bolekov, Vaughan, and Co. (Lim.)	5s.
10	10	10	10	Cairnbole Gas Coal (Limited)	5s.
10	10	4s.	April, 1876	Chillington Iron (Limited)	6s.
10	7	—	—	Clyde Coal (Limited)	7
23	20	10s.	Dec., 1874	Ebbw Vale Steel, Iron, and Coal (Lim.)	7s.
10	6	nil	nil	Fife Coal (Limited)	7s.
10	10	—	—	Ditto Prepaid	7s.
10	10	—	—	Ditto New	7s.
10	10	—	—	Lochore and Capel-lrae (Limited)	4s.
10	10	—	3	Marbhla Iron Ore (Limited)	8s.
10	10	—	nil	Monkland Iron and Coal (Limited)	4s.
100	100	5	4	Ditto Guaranteed Preference	6s.
100	100	nil	nil	Nant-y-Glo & Blaina Ironworks pref. (L.)	20s.
1	1	15	15	Omon and Cleland Iron & Coal (L. & Red.)	7s.
1	10s.	15	15	Scottish Australian Mining (Limited)	35s.
Stock	100	nil	nil	Shotts Iron	8s.

**COPPER, SULPHUR, TIN.**

4	4	—	—	Canadian Copper and Sulphur (Lim.)	5s.





<tbl\_r cells="6" ix="5" maxcspan="1" maxrspan="

moderate power were of enormous size. Just as pressures were increased the size of the engine diminished. If to-day our ocean steamers were obliged to go back to the moderate pressures of 30 years ago their engines would develop less than one-third of their present power. Now, if we can double or treble the speed of an engine we can, as in doubling pressure, at a single step obtain the same power with an engine of one-half or one-third the size. This advantage is a very great one in every way. Foundations, engine, and engine-house are all smaller and cheaper, and where an engine is to be sent to a great distance the saving in cost of transportation makes a heavy percentage in favour of the lighter and more powerful machine.

Among the features which contribute to the success of the Allen and Porter engine are the positive movements of the valves, their working equilibrium both of pressure and current, while steam and exhaust valves are driven independently. The steam-valves have their movements controlled by the governor, but the exhaust is fixed. The piston speed is from 700 to 900 ft. per minute, and, as we have seen, is in exceptional cases above 1100. The blow which the sudden admission of steam strikes upon the piston, and through the piston and connecting rods upon the crank pin, is cushioned by putting in reciprocating part of such weight that the steam expends a portion of its force in starting them in motion. Once in motion their momentum is utilized in keeping up the turning force upon the crank when the steam by expansion is losing its force. Familiar illustrations of the smooth running of high speed engines with heavy reciprocating parts are to be found in locomotive and propeller engines. In the locomotive, especially those with three or more pairs of wheels coupled, the reciprocating weight is exceedingly heavy, yet they run with great steadiness and smoothness of motion, and the same is true of propeller engines. It is an easy problem to compute the weight of parts required to give an engine perfect steadiness and smoothness of rotation at any number of revolutions per minute. The workmanship of these engines is excellent, and the governor which controls the point of cut-off is of the well-known Porter pattern. There is no form of governor so extensively used in England and on the Continent as this; indeed, its use may be said to be almost universal. It is extremely sensitive, and has complete control of the engine.

## Original Correspondence.

### NEW QUEBRADA MINE.

SIR.—An impression is becoming current that under the new management this mine is taking an entirely new and improved position. It is evident from the mine reports, for the publication of which we have to thank the new board, that instead of irregular lots of mixed, and in great part useless, stuff regular supplies of good ore of full paying quality, running as I have seen from 11 to 18 per cent., are coming forward, but it is difficult for an outsider to estimate the precise value of these shipments. We were informed some time back that a satisfactory traffic arrangement had been come to with the railway company, whereby the onerous engagements of a bygone period had been set aside, or at least suspended. It is evident that the prospects of the present shareholders depend upon this new arrangement being faithfully carried out, and without in any way wishing to press the new board for minute information upon details, I think it would be for the advantage of all concerned if we were told how matters are progressing. The shares are now standing at a merely nominal price. If the position of the mine is no better than it was, the sooner we know it the better; if it is really improved, it is only right that all should know it, so as to prevent an uninformed shareholder sacrificing his shares to some one behind the scenes better informed than himself. I wish, therefore, to suggest to the board that they should inform us whether the mine is fulfilling its obligations to the railway company under the existing traffic arrangement, and it might further be in their power to tell us whether any steps have been taken to make a new arrangement for next year, for which it seems to me the time has now come.

*London, Oct. 25.*

A SHAREHOLDER.

FLAGSTAFF COMPANY.

SIR.—A circular was forwarded yesterday to some of the debenture-holders of the Flagstaff Company, bearing the signature of F. W. Snell, of 1, George-yard, Mansion House, which contains such extraordinary statements as will, no doubt, call forth due reply from those against whom his animadversions are aimed. Having been personally mentioned as present with others at a late meeting of debenture-holders convened by Mr. Pearson, I find myself especially particularised as formerly superintendent of Tecoma Mine. If Mr. Snell thus prominently brings my name before the public he, the company's solicitor, should have stated (as there have been three superintendents of this unfortunate mine) that my connection with Tecoma resulted in the issue of a report, dated Oct. 30, 1873, or within ten months of the formation of the company, exposing the grossest swindle ever perpetrated on a confiding public. Mr. Davis and his friends receiving 300,000/- in cash and shares for a property that was at the time not worth as many pence.

With regard to the meeting of debenture-holders, the subject of Mr. Snell's criticism, I can bear witness to the fact that, with the exception of two or three persons, whose names were not in the possession of the trustee, notice was duly posted to every debenture-holder. It is a fact within my knowledge that holders of over 10,000/- worth of debentures have requested Mr. Pearson to oppose Mr. Snell's application, and the statement that he (Mr. Pearson) made at the meeting was that he held proxies for several thousands, and had that morning been waited on by gentlemen holding over 5000/-, expressing their concurrence; and since then he has received further support and countenance in the opposition he offers to Mr. Snell. "What, therefore, can you think of Mr. Pearson's printed circular?" as Mr. Snell asks, except it is literally true.

The evidence has not yet been brought before the Court, but it will be, and Mr. Snell's circular savours merely of an attempt to prejudice the case, the facts being (excuse the Hibernianism) extremely one-sided. For this city attorney's disinterested desire to protect the debenture-holders "at his own expense" I have no words wherewith to express my grateful astonishment, and thir kno occasion should be let slip by without announcing to unbelievers such commendable philanthropy. *Credit Judeas.*

RAYNER ST. STEPHENS, Mining Engineer.  
Great Winchester-street Buildings, London, Oct. 25.

### FLAGSTAFF COMPANY.

SIR.—Some editorial remarks on the affairs of this company, in last week's Journal, struck me as so sensible and to the purpose that I am provoked once more to try and say a word, through your assistance, to those interested in the undertaking. Some months ago, in a letter to you, Sir, I sought to draw the attention of the shareholders to a scheme by Mr. Pearson, which commended itself strongly to the judgment of myself and several legal friends, and which had for its object that reorganization, or, as he puts it, re-formation, of the company that now appears to you as so desirable. It is the only practical plan that has been put forward. Nothing whatever has been done by the board since Mr. Vincent took the helm, and promised "influential men of means" as ready to join the direction, and a gigantic effort was to be made, but nothing has been produced, not even the "mouse." Two or three have been elected directors, and after a brief sojourn have resigned, and now there are but two directors, both Americans, but one is naturalised.

The annual general meeting, overdue six months, has not been held, no accounts passed, no report made. Meantime petitions to wind-up are coming in, and the salaries of the officers of the company in London and the management in Utah are greatly in arrear, and no opportunity of subscribing a fund for their relief is afforded to the shareholders, who do not even know that they are in imminent danger of being left without a single representative at the seat of their property in Salt Lake City. I have seen this morning a circular by Mr. Snell full of statements and charges that have been answered over and over again. He is desirous of helping the de-

benture-holders "without asking any pecuniary support," the generous man; but it seems to me "that the trusts should be wound-up under the direction of the court" is sufficient protection to all, and that having agreed in that same decree "that all imputations against Mr. Pearson and Mr. Harvey should be withdrawn." He is out of date, and beyond patience in renewing his scandalous attacks.

LAWYER.

### PANT-Y-MWYN MINE.

SIR.—In reference to the observations contained in Messrs. Watson Brothers' circular, in last week's Journal, great stress seems to be laid on the issue of certain shares in the above company at a discount. They have on more than one occasion referred to this, and I am puzzled why they should repeat it again. Will they bear in mind that those shares were issued prior to the great and valuable discoveries of lead being made, which has resulted in the increased value of the shares, and their being so eagerly sought for? When I was last down at the mine, Captain Hughes informed me that he had received instructions from the directors to look after an engine for erection at the Modlyn shaft; and now that an important discovery has been made in this part of the mine, it will doubtless be pushed forward without delay. With regard to the monthly cost, I saw the cost-sheet for the month, and can assert it was only a trifle over 2000/. The present discoveries have been made at the upper western portion of the great bulk of ore, which will no doubt be laid open in the eastern and deeper workings. These have been worked chiefly from the Day level at 100 yards deep to a level driven 30 yards deeper, and whence they are extracting large quantities of rich ore, assaying about 80 per cent. for lead. It would be very difficult at present to calculate the reserves of ore that exist between these levels; but in depth the lode is increasing in strength and productiveness, and a succession of deeper levels will no doubt open out immense reserves. The Modlyn shaft is being sunk with all possible dispatch, and has recently intersected the main lode, some 30 yards below adit level. The ore at this point is pure in its character, and is no doubt a continuation of the rich course of ore at Griffith's shaft workings. The heading wall of the lode has a smoothly polished slicken side, usually found highly congenial to lead deposits of magnitude, and most frequently in close proximity to them, and from this section of the mine they may calculate on continuously increasing returns; and when the engine is erected, to cope with any water that may break out, this mine will, without doubt, be one of the most valuable and prolific in Wales. The lode that traverses the sett is the same as that which yielded 400 tons monthly for many years to the Mold Mining Company, and it is believed that upon further development Pant-y-Mwyn will be able to return the same amount

ARISTOTLE.

### PANT-Y-MWYN MINE.

SIR.—We wish to correct a slight error which appeared in your City Article of last Saturday in reference to the above, wherein it is stated:—"In sinking the Modlyn shaft, which is about 210 yards to the east of Griffith's shaft, from where they are returning about 70 tons monthly; they have struck into rich ore, which the engineer believes to be the top of the great course of ore dipping towards it from Griffith's shaft workings. This is about 125 yards below the great day level, or 125 yards from surface." In the first instance the returns have hardly yet touched 70 tons monthly; we should say about 60 tons. Secondly, in reference to the discovery at the Modlyn shaft, it was made about 25 yards below the great day level, or 125 yards from surface. We have personally inspected this property on several occasions, and have great faith in its intrinsic value and future prospects.

JONES and HOUSTON.

[For remainder of Original Correspondence see this day's Supplement.]

### BRITISH SILVER-LEAD MINING COMPANY—SPECIAL REPORT.

Oct. 23.—Complying with your instructions, I visited your mines on Saturday last, the 19th inst., and have now the pleasure of submitting my opinion of the prospects, and most advisable course to pursue in its development. The mines are situated in the parish of Festiniog, and about two miles from the important town of Blaenau, in the county of Merioneth, to which place a railway is constructed, the same passing within 100 yards of your works, and from which town transit is easy and inexpensive. The geological features are in every respect favourable, the strata primitive, and the conformation of the surface specially striking, showing an extensive upthrust along the line of lode; there are also numerous feeders traceable into the hanging, and other characteristics found in combination with rich ore deposits in the primitive formation. The main lode is powerful, strongly mineralised, well defined, bearing about 12° north of east, and has a favourable underlie. Seldom have I seen a lode so rich at surface, and one that shows more decided improvements in strength and value as depth is obtained. You can better understand when I say that with the present appearance only profits can be made by proper appliances for dressing and separating the ores, but if the lode still increases in value as depth is attained, and only in proportion to that indicated by your present sinkings, you may reasonably hope for a bright future. I venture this opinion because the favourable symptoms, above explained, are to be seen in trial pits on the lode, thereby proving the mineralised character for some hundreds of yards in length, and in each trial to be seen most beautiful lode compound, having all the accompaniments of rich ore deposits.

In conclusion, I would remark that as a rule mining reports seem to be stereotyped from the fact that all lodes, rocks, and mine operations are not very dissimilar, but the pith will be found in the opinion upon prospects. I give mine without hesitation, which is that your project is sound, fair, and legitimate, and well worth the attention of capitalists. With respect to future operations I would advise that as enough is already done to prove the lode on surface, your energy should be employed to prove the same in greater depth by sinking your eastern shaft with all speed. Appearances during its progress will best dictate as to future works, which, as I expect, will be favourable, the outlay in steam drills and dressing machinery should be simultaneous, and its complete development taken seriously in hand.—ABSALEM FRANCIS.

### AUSTRALIAN MINES.

ENGLISH-AUSTRALIAN (Gold).—Capt. Raisbeck, Sept. 2: In the 420 ft. level we have extended the drive 14 ft., and not meeting with quartz the men were put to rise from the back of the level north of former rise; up 35 ft. struck quartz, but no gold visible. No. 2 rise has been extended 29 ft., distance up from level 47 ft.; we passed through quartz for several feet, but have seen no gold. In the 320 ft. level No. 2 rise has been put up 50 ft., and struck the same stone as in No. 1 rise. We have driven south from No. 1 rise 79 ft. upon the course of the lode, and holed to No. 2 rise; there is a nice run of stone, but very poor as yet.—Stones: We have crushed 37 tons of stone from the stopes, and 180 tons from the different rises. The result for the month nearly 18 ozs. of retorted gold; two-thirds of this gold came from the stopes. We shall have more men on the stopes next month. We have let a tribute in the back of the 320 ft. level, north of our present workings; the men can see a little gold. We have also let a tribute north of Rehouse's claim, on surface leaders. They have raised about 15 tons, and are now crushing. The company is to receive 50 per cent. of the gross yield.

ENGLISH AND AUSTRALIAN (Copper).—The manager (Port Adelaide, Sept. 5) writes.—The stock of coal at Port Adelaide was about 511 tons, besides three ships to arrive from Newcastle, New South Wales. At the Port Adelaide works there were two smelting and two roasting furnaces at work, and at the Newcastle works there were four smelting, four roasting and two calcining furnaces. Since the date of last advices about 60 tons copper had been shipped.

SCOTTISH AUSTRALIAN.—The directors have advices from Sydney, dated August 31, with reports from the Lambton Colliery to August 19. The sales of coal for August amounted up to August 29 to 21,265 tons.

PORT PHILLIP AND CODONIAL (Gold).—Aug. 31: The quantity of quartz crushed on both the company's and tributaries' accounts for the four weeks ending August 14 was 4641 tons; pyrites treated, 30 tons. Total gold obtained, 1389 ozs., 13 dwts. 12 grs. Receipts (including 21764. 4s. 6d. obtained from tributaries), 4320. 18s. 1d.; profit, 1872. 13s., added to which was the previous balance of 1801. 3s. 11d., making an available balance of 3673. 18s. 11d. The amount divided between the two companies was 18000/-, the Port Phillip Company's proportion of which is 10400. The balance carried forward was 2073. 18s. 11d. Remittance, Oct. 18: "Month ending Oct. 9—Gold obtained from company's quartz, 348 ozs. Gold obtained from tributaries' quartz, 1227 ozs. Profit, 1304. Remittance, 11002."

YORKE PENINSULA.—The directors have advices from the Committee of Inspection at Adelaide, dated September 4, with report from the Kurilla Mine to the 2nd of that month. The following are extracts from Captain Anthony's reports:—Kurilla Lode: The 55 fm. level is driven east 7 fms., and west 4 fms., from Hall's shaft. . . . I am sinking a winze in the 45 east, 15 fathoms from the engine-shaft, with the object of ventilating the 55; sinking was commenced where a bar of ore crossed the lode in driving east. After sinking from 2 to 3 ft. a mere film of ore in the eastern end of the winze was come upon, which has continued and enlarged; it is now 1 foot wide of good ore, or worth 3 tons of 17 per cent. ore per fathom. I hope soon to find this ore in the 55 drive, and should it continue it will prove a great help in extending the drive to the main run of ore at and about the hauling shaft. At the 45 west the wall on which I have been driving is more decided; the ground is softer, wetter, and more promising, and there is more or less of ore sprinkled throughout the lode and surrounding rocks. . . . The stopes in the 45 east of the hauling shaft, continue to produce fully 4 tons of 20 per cent. ore per fathom.—Morpeth's Lode: The engine-shaft is nearly 8 fathoms below the 39; the lode is 6 ft. wide, with two branches of ore of about 1 foot wide each, or (say) 6 tons of 17 per cent. ore per fathom. . . . At the 30 east the lode has widened to over 4 ft., in which there

are six branches of ore, the rest being schist. The lode at the 20 presented a similar appearance before entering the run of ore ground. I am hopeful that I shall be able to report a good lode here next month.

I consider the prospects of this lode remarkably good. There are over 400 fms. of lode in the back of the 30, most of which will make good tribute ground, and I shall set it as soon as a better price for copper is obtainable.—Ore Returns: In addition to the 100 tons mentioned in the last report as in course of shipment per Ontalpa 52 tons more had been shipped by that vessel, and 55 tons by the City of Adelaide, the whole averaging nearly 19 per cent. Ore on hand and at the mine, 171 tons of 17 per cent., and 80 tons of dredge ore of about 5 per cent.

### THE WEEK.

SATURDAY, Oct. 19.—Business was done to-day in National Provincial Bank shares at 79; in August the same shares were selling at over 90. Sales were also made of City and Westminster Banks. In mining shares Eberhardt, Richmond, and Colorado were wanted. Business was done in United Mexican at 42. Wye Valley fell to 12/, and West Wye Valley to 21. Great Lixey and Van were offered at 16, but buyers did not come forward. Rockhope are now 11s., and Parys Mountain 5s.

MONDAY.—Van shares were offered at 15, and Cape Copper fell to 28½. Colorado shares were rather in demand again at 24 and 25. Port Phillips were also wanted; the reports from the mine continue good, and for the month ending Oct. 9 a profit of over 13000/- was made. The shares are worth buying. The Scottish Australian Mining Company propose a dividend at the rate of 15 per cent., and the extension of the reserve fund to 21,000. In the miscellaneous department London Steamboat fell to 4½, Royal Aquarium to 5½, and Otago Investment 13½.

TUESDAY.—Rather a bad day for gas and bank shares. Imperial Continental closed 10/- lower; Commercial, Gas Light, and Phoenix, 5/-, London Joint-Stock Bank and London and Westminster dropped 2½. City Bank was dull at 15½, having lost the advance shown last week. Shares in the various trust companies were pressed for sale. Holders of Government Stock Investment Company accepted 11½, and there were sellers of Railway Share Trust at 5½. Mining shares remained steady. Eberhardt were in request at 12½, Don Pedro at 12s., and Port Phillip at 11s., ex div. Not much was done in Richmond, but people on the market are good buyers of all that can be got.

WEDNESDAY.—Gas and bank shares fared even worse to day. It would take very little now to cause a run on two or three banks in the City, whose credit has unfairly suffered by idle rumours. A drop of 5/- took place in London and Westminster, the dealers at the close refusing to bid more than 50; at one time during the day there were buyers at 75. Leeman's senseless Act is now found to eat both ways; the dealers are afraid to speculate in bank shares, and will not take any lots that are offered, no matter how cheap, until they have found a place for them. London Joint-Stock fell 2½, and the others about ¾ per cent. on the average: two or three excepted, which having nothing to lose remain very firm. Gaslight and London Gas tumbled down 5/- each. In mining shares Eberhardt advanced to 4½.

THURSDAY.—For over a week there has been a daily fall in Grand Trunk securities; the great bulk of these are held in the North, and as the majority of the sales come from that quarter, probable buyers here simply look on so far, fearing that lower prices may yet prevail. The half-yearly meeting will be held on Tuesday next. The gross receipts show an increase of 20,167/-, and the working expenses have increased by 2758/- Freights improved, but there was a falling off in the passenger receipts. It is noticeable that Sir James Ramsden, Grosvenor Holkirk, and Kirkman Hodgson, M.P., have left the board. For a long time past Trunks have invariably touched a low figure towards the end of the year, and it has always been good practice to buy and keep the stocks until the spring following. An advance of 50 per cent. has not been unfrequent. The ordinary are now 6, first preference 35, second preference 24, and third below 11. The ordinary has not been so low for years past. Last October the price of the first preference was 45; of the second, 29; the third being 17.

FRIDAY (Opening).—Turkish stocks are inclined to firm, on the news that the Sultan accepts the proposed English reforms. The Five are strong, at 11½. Egyptian Unified and Preference are, however, each down ¼. Bank shares show a general improvement, Westminster being 56, Joint-Stock 41, Union 38. There is also a rise of 2 in Imperial, Continental, and in Commercial Gas. Tin shares are neglected, lead shares not being in much better plight. The following foreign firms are firms, and wanted:—Eberhardt, Sierra Buttes, New Zealand Kapanga, Plumas River, and Port Phillip. *Two o'clock.* Turkish Five now only show a rise of ½ on the day, being exactly 11. Great Eastern and British are down ½, and North-Eastern are ½ per cent. Sellers of Westminster now ask 58; buyers offer 42 for Joint Stock; Union unchanged. A moderate business is being done in Consolidated, Mercantile River Plate, and the 12, paid shares of National Provincial. Roman Gravels, 6 to 6½; Tankerville, 3 to 3½; Rockhope, 8 to 10s.; West Chiverton, 1½ to 2; Colorado, 2½ to 3%; Eberhardt, 3½ to 4%; Frontino, 2 to 2½; Kupanga ½ to 1½; Richmond, 9½ to 9¾. *Four o'clock.*—West Chiverton, 1 to 1½; Roman Gravels, 5½ to 6½; Javali, 8s. to 7s.; Plumb Eureka have been dealt in at 2½, and Sierra Buttes at 1½. Business was marked yesterday in London and Westminster at 52%, and to-day at 53. Wilson and Crum, 2½ to 3½; Chapel House, 2½ to 3; Newport Abercarn, 4 to 4½; Cardiff, 1½ to 1½; Altami 3 to 3½.

FERNAND R. KIRK.

The following report was received too late for insertion in its proper place:—

BWLCH UNITED.—N. Bray, Oct. 19: Enclosed I beg to send you cost-sheet and d merchants' bills for the month ending the 12th inst. Ritchie's engine shaft is now down about 4 fms. below the 90, and the water has so increased that we cannot any longer sink with barrels to advantage; consequently I have had the old engine-shaft to the west drained, and the bottom lift of pump taken up to fix here without delay. As explained to you when at the mine, and as the cost-sheet shows, the men are not constantly employed stopping at the 6 fm. level, as they have been drawing, filling and landing stuff, and securing old stumps, &c., at the same level, and any other incidental work, so that the shaftmen may be hindered as little as possible. So far as opened in length and depth, the stope keeps up to its full average produce.

### CLEANING METAL PLATES.

The nature and novelty of the invention of Mr. EDWIN YATES, of Glasgow, consist in the use and fitting of a pair of revolving brushes in front of the rolls of an ordinary plate rolling and pressing machine, for re-rolling or flattening plates after being brushed by hand. The brushes are each preferably made in one, two, three, or more longitudinal bars and rails, equally divided round eyes or arms on their spindles, and divided or set so as to revolve at a high speed in the spaces between or opposite each other, close together, so as to brush the upper and lower surfaces of the plates as they are fed in at first by hand until the front end of the plates enter the pressing and drawing rollers beyond, which then draw the plates through the brushes, which are driven and revolved at a great speed in the different direction to that in which the plate is moving and the pressing rollers running. A wedge or trumpet shaped feeding-in mouth-piece is fitted across the whole front of the brushes, wide enough for the broadest plate to be rolled and cleaned, and a continuation of it is fitted between the brushes and the rollers to guide the plates from the brushes to these.

The shafts of the brushes and rollers are erected to revolve in bushings in the cast-iron side frames of this improved combined brushing and rolling mill or machine, and the spindle of the upper or lower brush might be driven direct by a belt and pulley or pulleys on it from any adjacent motive shaft, and which by spur wheels at the other end might give motion to the other brush by its spindle, both brushes revolving at the same speed towards each other; and when desired guides may be formed at the edges and through between the brushes of the feeding-in mouth-pieces for the guiding in of the plates, which would be placed in a heap on a feeding-in table in front of the machine ready for being fed into the brushes

## WATSON BROTHERS' MINING CIRCULAR.

WATSON BROTHERS,

MINEOWNERS, STOCK AND SHARE DEALERS, &c.  
1, ST. MICHAEL'S ALLEY, CORNHILL, LONDON.

Ten years ago the weekly information which had previously been published for a great number of years in WATSON BROTHERS' Mining Circular was transferred to the columns of the *Mining Journal*, with the following announcement; which is now reproduced in consequence of the numerous letters and enquiries handed to them of late in reply to one which appeared in the *Journal* on the Clementine Mine.

In the year 1843, when mining was almost unknown to the general public attention was first called to its advantages, when properly conducted, in the "Compendium of British Mining," commenced in 1837, and published in 1843, by Mr. WATSON, F.G.S., author of "Gleanings among Mines and Miners," "Records of Ancient Mining," "Cornish Notes" (first series, 1862), "Cornish Notes" (second series, 1863), "The Progress of Mining," with Statistics of the Mining Interest, annually for 21 years, &c., &c. In the Compendium, published in 1843, Mr. WATSON was the first to recommend the system of a "division of small risks in several mines, ensuring the success in the aggregate," and Messrs. WATSON BROTHERS have always a selected list on hand. Perhaps at no former period in the annals of mining has there been more peculiar need of honest and experienced advice in regard to mines and shareholders than there is at present; and from the lengthened experience of Messrs. WATSON BROTHERS they are emboldened to offer, thus publicly, their best services and advice to all connected with mines and mining.

Messrs. WATSON BROTHERS are daily asked their opinion of particular mines, as well as to recommend mines to invest or speculate in, and they give their advice and recommend mines to the best of their judgment and ability, founded on the best practical advice they can obtain from the mining districts, but they will not be held responsible, nor subject to blame, if results do not always equal the expectations they may have held out in a property so fluctuating as mining.

The great extension of mining business, the difficulty so often complained of by country shareholders in getting accurate and disinterested information as to the state of Cornish and Foreign Mines, and of the financial and real position of mining companies generally, have induced Messrs. WATSON BROTHERS to make their Circular now published in the *Mining Journal* more extensively known, and to state:

That they issue daily to clients and others who apply for it a Price List (as supplied to most of the London and country papers), giving the closing prices of Mining Shares up to Four o'clock.

They also buy and sell shares for immediate cash or for the usual fortnightly payment in all Mines dealt in on the Mining and Stock Exchanges, at the close market price of the day, free of all charges for commission. They deal also, on the same terms, in the Public Funds, Railways, Telegraphs, and all other Securities dealt in upon the Stock Exchange.

Having agents in all the mining districts, they are constantly getting mines inspected for their own guidance, and will also obtain special reports of any particular mine for their clients, for the inspecting agent's fee of £2 2s.

Many years ago we cautioned our clients against taking shares in unlimited banks, yet, no doubt, some hundreds of persons who may be completely ruined by the failure of the City of Glasgow Bank would have hesitated in touching a limited mine, where the profits per cent. might probably be as large, and the loss, in case of loss, of limited and known extent. We prefer and advocate what we understand something of, and such shares as we can safely recommend on the principle we have always supported—that of a division of risk in a few mines, so as to secure success in the aggregate. The great "score" of mining has been the "Cost-book"—or rather the mismanagement of it—such as we have lately witnessed in Cornwall, where, e. as in these unlimited banks, the liability of each shareholder extends to the whole of the debts. But mines now are mostly limited, and no one who invests can be called upon for more than he goes in for, unless for necessary purposes, and then it is entirely at his own option. The failure of this bank has happened at an unfortunate time. For months past there has been great depression in trade, and low prices in stocks and shares, and those who have had money to invest have hoarded it, to see "how things would go," and to get them at their lowest. This depression is now increased by the quantity of shares of every kind thrown on the market, and the fear of further disasters. And it generally, if not invariably, happens that when everybody wants to sell nobody wants to buy. If the public do not come in to relieve them dealers cannot be expected to overload themselves with stock, especially when if they buy of one person to-day another may offer the same stock still cheaper to-morrow.

The only way in such times is for shareholders to keep quiet, and for those who have money to invest to take advantage of the times and buy into good things. We are almost daily asked by numbers of correspondents our opinion of different mines, and what is good to buy, and we endeavour to answer as correctly as we can, and in a sort of panic like this it is our duty to caution them against selling, or being frightened at lower market quotations.

D'ERESBY MOUNTAIN.—The heavy expenditure for machinery already erected, and anything more that may be required, as well as the development of the Valley sett, being charged to capital account, the sales of lead will be placed against current costs, and will we hope soon lead to dividends. In our opinion, and we are among the largest shareholders, the issue of shares has placed the company in a better and stronger position than it has ever been in before, owing to the limited capital it commenced with. Shares, therefore, are now better worth buying than ever.

D'ERESBY CONSOLS.—We do not anticipate any great improvement till the Cobblers' lode, which is a north and south lode, is met with. The open cavity and easier ground in the east and west lode on which we are driving is greatly in favour of lead at the junction.

ABERLLYN.—If all we hear of this mine be true, and we have no reason to doubt it, shares should be bought at once. None of these mines have had any market support, and Aberllyn may rise to double its present price from its merits alone.

MORFA DU.—This mine is opening out all that we predicted of it, but we suppose until all the calls are paid up shares will not move upwards. We look, however, to the mine, and not to the market, and if a good price is obtained for the bluestone immediate profits will be made. The lode is worth 7 tons per fathom, and as the stuff is sold in the stone there is only the expense of raising it.

WEST CHIVERTON.—If our correspondent had studied the accounts as given in the City article of the *Mining Journal* he would not now express surprise at the fall in shares.

SANTA BARBARA.—We hope the profits here will soon reach 1000/- per month, for the quantity and quality of the gold is improving. We called attention to the shares when they were very low in price, so that those who followed our advice have been getting good dividends, and will double the capital they invested. Some weeks ago we referred to Pitangui and its prospects, and hope shortly to hear of the jacotina being reached. There is the prospect of a good rise in shares, which are now very low. Management same as Santa Barbara.

GAS.—Just what Australian and Tasmanian tin has done for mines electricity seems likely to do for gas, and the holders of gas shares are much about in the same state of alarm that tin miners were on the first advices from Australia. Tin, however, is an article in universal request, and will always be in demand at some price or other. There are the chances, also, of mines at the Antipodes becoming exhausted, or too expensive to be worked so as to compete with our home mines, and we shall have ever before us the prospect of hope and better times, however deferred. Will it be so with gas? Writing many years ago in the *Mining Journal* on the formation of mineral veins, we entered fully into the theory of electrical currents and their condensation of minerals against the cross-courses, which acted as non-conductors, and against which the great masses of ore were found. And we added that electricity was a more powerful agent in the world and in the ways of life than was generally acknowledged, and that its uses might become better known and appreciated as time progressed! It is making strides now with a vengeance, and with a blaze of light, and if this light can be divided into jets, as we are assured on high authority in England that it can, then the great monopoly of gas companies will be at an end.

PRINCE OF WALES.—A tribute pitch was set on the Wheal Brothers silver lode in the back of the 24 level, two months ago, at 13s. 4d. in 12, tributes to pay for dressing, &c. The time being up, the stuff raised has been assayed by Mr. Jenkins: No. 1 sample yielded 2849 ozs. of silver to the ton; No. 2, 102 ozs. Private assays gave 770 ozs. to the ton. We have not yet learnt the quantity.

SATURDAY, OCT. 19.—Market for tin shares firm. Carn Brea, 30 to 32½; Dolcoath, 22 to 24; South Condurrow, 10 to 10½; South Frances, 4½ to 5½; Tin-

croft, 6 to 7; Aga, 3½ to 4; Grenville, 1½ to 2; Peevor, 6 to 6½; Aberllyn, 11 to 12; Great Laxey, 15½ to 16½; Roman Gravels, 6½ to 6½; Tankerville, 3½ to 4½; Monydd, 6 to 6½; West Chiverton, 2 to 3; East Van, 2½ to 3; West Tolgus, 40 to 45; Parys Mountain, 4 to 6s.; Pateley Bridge, 3½ to 4; Penstruthal, 3s. to 5s.; Roman Gravels, 6 to 6½; Rockhope Lead, 10s. to 12s. 6d.; South Condurrow, 10 to 10½; South Frances, 4½ to 5½; Carn Brea, 30 to 32½; Dolcoath, 22 to 24; Peevor, 6 to 6½; South Condurrow, 10 to 10½.

TUESDAY, OCT. 22.—Market again very quiet, and prices are merely nominal. Aberllyn, 11 to 12; Carn Brea, 30 to 32½; Devon Great Consols, 1 to 1½; Dolcoath, 22 to 24; East Van, 2½ to 3; Great Laxey, 15 to 16; Leadhills, 1½ to 2½; Parys Mountain, 4s. to 6s.; Pateley Bridge, 3½ to 4; Penstruthal, 3s. to 5s.; Roman Gravels, 6 to 6½; Rockhope Lead, 10s. to 12s. 6d.; South Condurrow, 10 to 10½; South Frances, 4½ to 5½; Tin-croft, 6 to 7; Van, 10 to 12; West Chiverton, 1 to 2; West Tolgus, 40 to 45; Aga, 3½ to 4; Grenville, 1½ to 2; Peevor, 6 to 6½.

WEDNESDAY, OCT. 23.—Market continues very inactive, and prices without any material alteration.

THURSDAY, OCT. 24.—Market again dull, and prices nominal. Van, 15 to 16; Great Laxey, 15 to 16; Leadhills, 2 to 2½; East Van, 2½ to 3½; Roman Gravels, 6 to 6½; Tankerville, 3½ to 4; Carn Brea, 30 to 32½; Dolcoath, 22 to 24; West Frances, 4½ to 5; South Condurrow, 10 to 10½; Aberllyn, 11 to 12; Clementina, 1½ to 2½.

FRIDAY, OCT. 25.—Market for tin shares rather firmer. Dolcoath, 23 to 25; Carn Brea, 30 to 32½; Tin-croft, 6 to 7; South Frances, 4½ to 5; South Condurrow, 10 to 10½; West Tolgus, 42 to 44; Grenville, 2 to 2½; Pateley Bridge, 3½ to 4; Clementina, 1½ to 2½; Van, 15 to 16; Great Laxey, 15 to 16; East Van, 2½ to 3½; Leadhills, 1½ to 2½; Roman Gravels, 6 to 6½.

## Mining Correspondence.

## BRITISH MINES.

ABERDAUNANT.—S. Toy, Oct. 23: The deep adit cross-cut is now driven north 8 fms. 5 ft.; during the past week the ground has changed for the better, and we are now meeting with soft branches containing nice carbonate of lime and spots of lead, which are underlying north towards the lode.

ABERLYNN.—John Roberts, Oct. 23: No. 1 Adit: We have commenced sinking the winze to communicate with the large course of blonde in the middle adit. We are sinking on the eastern side of the lode, and shall cut through it in sinking. There is good blonde in the face of the lode. At the middle adit the lode is looking well for blonde. The shale on the footwall is wider and softer than it was, and the blonde on that side partakes more of the character of the blonde which occurs in the shale. At the deep adit we have commenced to rise towards the middle adit; this rise is now out of the run of the blonde, but I expect to get into it before we get a communication. The surface work is getting on rapidly.

BEDFORD UNITED.—R. Goldsworthy, Oct. 24: There has been no lode taken down in either of the levels since my last report, nor is there any other change to notice. We are busy preparing for the sampling to-morrow.

BETTWYS Y COED.—H. T. Haley, Oct. 22: The shallow adit end is in a fine-looking lode all the width of the end, and more lode standing south, worth for the part being driven on 25 cwt. of lead ore per fathom, and a good mixture of blonde. The deep adit east is opening out in the most satisfactory manner, and worth 25 cwt. of lead ore per fathom. In stopping the western end of the winze to make a footway and pass there is a fine-looking lode, worth 20 cwt. of lead ore per fathom. The surface work is being progressed with all dispatch.

BLUW HIL.—S. Bennett, P. Bennett, Oct. 19: The Blue Burrow shaft is being sunk on the north lode below the adit, at 6½ per fathom. That same north lode in the 30 east end (on the north side of a gossan which lies between those two points) is worth 12½ per fathom, and altogether of a most promising appearance.

BODIDRIS.—H. Hotchkiss, Oct. 23: There is no particular change to notice underground here since my last. All are going on regularly, and with as much speed as possible. The shaftmen are getting on well with easing and dividing the shaft, and I hope to have the pit head erected on Friday next.

CAMBRIAN MINES.—T. Glanville, Oct. 19: ESGAIR-FRAITH: Eastern Shaft: In my report of Oct. 14 I informed you that we made a new discovery of lead ore in the 10, and so far as opened on was 3 ft. wide, but as we were not through it it was impossible to state the value of the same. We have now cut through the lead part of the lode, and find it to be 4 ft. wide, yielding at least 2 tons per yard. In cutting plat in the bottom of the shaft we have a lode of very rich copper nearly 2 ft. wide, and producing 3 tons per yard. In the 70, west of shaft, the lode is producing good stones of copper, with every indication of an early improvement. Since my last report we have been laying tramroad in the 46 level, west of shaft, and shall now recommence driving on the lode, and by the appearance of the sulphur in the breast of the level we may expect to meet with something good at an early date. We have now broken 10 tons of lead from the new discovery.

ESGAR-HIR.—We are still cross cutting towards the main part of the lode.

CLEMENTINA.—J. Roberts, Wm. Sandoe, Oct. 16: We are making very fair progress with cutting the wheel pit, and we expect the wheel here by the time it is ready. We are also making ready to put down a new lift from the adit to the 15, which will replace the small one now working. There will be a little ground to cut down in the shaft, in order to fix the lift, which will be done whilst the wheel is being erected.

CLEMENTINA.—J. Roberts, Wm. Sandoe, Oct. 23: The wheel-pit is in a very forward state, and we are advised that the wheel is ready for shipment.

COMBMARTIN.—T. Comer, Oct. 24: The end driving south-east on the caunter lode is looking very promising; we are daily expecting a further improvement. In the same level north west the lode is yielding some nice seams of lead and blonde, which will have an appearance of further improving.

DE BROKE.—J. Phillips, Oct. 23: In the 55, driving east of Wilson's shaft, there is a good string of ore, and the lode generally has improved during the past week; ground compact, and rather stiff for progress. The 45 west has been resumed, and looks encouraging; lode 4½ ft. wide, with a leader on the north side producing large stones of ore, mixed with copper, quartz, &c. The 45 east is suspended for awhile. The winze sinking below the 35 east is in a large lode, made up of killar and a large proportion of crystallised quartz, and is opening stopping ground for lead ore. The stopes in the back of the 35 east is improved, and now yields 30 cwt. of lead ore per fathom. The stopes in the back of the 25 east is also improved to 35 cwt. per fathom. Biddings for 20 tons of lead ore are due on Saturday next. Machinery, dressing, &c., going on steadily as usual.

DE'ERESBY CONSOLS.—J. Roberts, W. Sandoe, Oct. 23: The large vugh has almost disappeared; the lode is wider, composed of spar, sulphur, and a little lead and blonde, letting out water freely.

DE'ERESBY MOUNTAIN.—J. Roberts, W. Sandoe, Oct. 23: The lode is very similar to what it was last week—a mixture of lead and blonde; lode from 1 to 1½ ft. wide. In No. 3 adit the rise is looking very promising; the lode is 2 ft. wide, with good ribs of lead and blonde. In No. 4 there is no change in the stope. The winze to No. 5 we have commenced clearing. The ground at the ends of the winze appears to have been stopped away. At the No. 5 adit we have cleared to about 18 fathoms from No. 3 shaft. The level is choked full of stuff, but the sides are firm, and we hope now to make good progress. The surface work is going on as fast as possible. The stonebreaker is being fixed, and will be ready in a week or so, in the meantime we are getting down, and treating the stuff from the upper levels.

DENBIGHSHIRE CONSOLIDATED.—R. Prince, A. Francis, Oct. 24: We still continue to raise capital lead from our 6s., some of the rocks weighing 1 cwt. We also have about 12 tons of lead raised from here, and the tribute pitch in the back of the 112 west, which is looking well.

DERWENT.—J. Morpeth, Oct. 21: The list of bargains let on Saturday last is herewith sent.—Jeffries' Shaft—Middle Vein: The 95 east continues by the side of the vein; in this level 8 fathoms back from the end, the vein is at present yielding 1 ton of ore per fathom. No. 1 stope is 6 ft. wide, worth 16 cwt.; No. 2 is 5 ft. wide, worth 18 cwt.; No. 3 is 5 ft. wide, worth 16 cwt.; and No. 4 is 4 ft. wide, worth 14 cwt. No. 5 stope is at present worth 14 cwt., having got too close upon No. 4, and we have suspended it for a couple of months or so. The 93, west of Jeffries', continues to lay open strong backs. No. 1 stope, in the back of this level, and 20 fathoms behind the end, reported at your annual meeting to be worth 18 cwt., has the last few days further improved to 1 ton 1½ cwt., worth 15 cwt. No. 2 is 4 ft. wide, but continues poor; value 6 cwt. No. 3 is 4 ft. wide, and worth 1½ ton per fathom. We have started four men to rise and stope about 2 fathoms behind No. 4 stope, where the vein is 3 ft. wide, and yields 14 cwt. of ore per fathom.—Sun Vein: The stope in the back of the 70 fm. level, 14 fathoms west of the shaft, is 2 ft. wide, and worth only 8 cwt. of ore per fathom. The 70 east is 2 ft. wide, and produces 10 cwt. of ore per fathom. The 70 west is 3 ft. wide, and worth 12 cwt. —Westgarth's Shaft—Middle Vein: The 93 east in the early part of last week came forward, and the men cut for the month ending with Saturday last 3 fms. 4 ft. 6 in., a little less than we had hoped to see them. This level is looking well; vein 5 ft. wide, and produces 1 ton 12 cwt. of ore per fathom. The 74 west, reamed by two men, is 1 ft. wide, and will lay open good stopping backs. The stope in the back of the 70 fm. level is 3 ft. wide, and produces 16 cwt. of ore per fathom. Surface work all progressing very well.

EAST CRAVEN MOOR.—David Williams, Oct. 24: The new shaft from surface is down 10 fms. 4 ft. below the 42. The vein has greatly improved, being fully 4 ft. wide, composed chiefly of spar gossan, and lead ore, worth fully 1½ ton per fathom. Other points without change to notice this week. Our surface work have commenced grating and dressing.

EAST DARREN.—Oct. 23: The cross-cut south, in the 92 east, has been driven during the past month 3 fms. 3 ft., in ground composed of a blue clay-slate, and occasionally branches of carbonate of lime. The 92, east of the cross-cut, on No. 1 branch, has been driven 1 fms. 1 ft. 2 in. in a lode 2 ft. wide, yielding on an average 8 cwt. of lead ore per fathom. The 80, east of cross-cut, on the south branch, has been driven 3 fathoms on a large and open lode, laying open tribute ground along the sole of the level, worth 10 cwt. of ore per fathom. In the 80, west of the cross-cut, on the south branch, has been driven 2 fms. 2 ft. on a lode 3 ft. wide, yielding from 10 to 12 cwt. of lead ore per fathom. In the 80 east, on the south lode, the lode is from 3 to 4 ft. wide, and looks very promising, now yielding small branches of ore. Richard's winze, sunk under this level, is down 12 fms. 6 in., the required depth in readiness for the 92 cross-cut when driven into. The stopes and pitches throughout the mine continue to yield fair quantities of lead ore.

EAST VAN.—Wm. Williams, Oct. 24: We are still pushing on west on the course of the lode; still cutting spots of lead, but not sufficient to value.

EAST WHEAL LOVELL.—R. Quantrell, Oct. 23: Fatow has been inspected by the Duchy agent, and we are now drawing up the materials here as decided upon at the meeting. In the south part of the setts we are driving east and west of the two shafts. The south lode is looking better than it was at the shaft, being larger and better defined, and containing a little tin and mudi. In Sworgan we are sinking below the adit, where the lode is 2½ ft. wide, containing tin throughout. We have also begun to clear up a shaft on the large lode, where there is a large deposit of leadstone, with a little tin.

GAWTON COPPER.—G. Rowe, G. Rose, jun., Oct. 19: The part of the lode now in the end of the cross-cut at the 117 is chiefly composed of capel and spar, intermixed with mudi and ore. The lode in the winze sinking below the 105 is 10 ft. wide, worth 2½ per fathom. The lodes in the stopes in the back of the 105 is worth 10½ per fathom. No. 2 stope, in the back of the same level, is worth 6½ per fathom. The tribute department is without change.

GLENROY.—R. Rowe, Oct. 23: There is no alteration to report to-day in the shaft sinking below the 80 only that the lode is again getting wider; now about 5 ft. wide, with a small mixture of blonde through the quartz part of the lode.

GOGINAN.—Oct. 23: There is no change of importance in any part of these mines since our last report; the lode in the tribute pitches varies in produce from 9 cwt. to 16 cwt. of ore per fathom. At surface operations are going on regularly, and the machinery is in good order. Samples of 28 tons of good quality silver-lead ore were sent out on the 15th inst. for sale on Tuesday next, and every effort is being made to get as much ore as possible by our next sampling day—November 12.

GREAT LAXEY.—W. H. Rowe, Oct. 22: Little change to notice has taken place in the bottom levels of the Deep Mine since our general report. Owing to the slide the 23rd end, north of Welsh shaft, is still in unsettled ground, and as we think the present one is not the main branch of the lode have, therefore, decided to cross cut at the end of the month. A fortnight since the 23rd end north struck into good ground, but the lode has just now again fallen off in value, and worth 18½ per fathom. A winze in advance is, however, very near where much

steps over the 130 yard level, west from Bolland's sump, is worth 3 tons of lead ore per fathom; worked by 10 men, at 40s. per ton of lead ore. The vein in Hill shaft, sinking under the 130 yard level, is 3 ft. wide, composed of limework and spar, with a good mixture of lead ore and blende. In the 225 yard level, driving west from Belton's sump, the vein is 2½ ft. wide, yielding good lumps of solid lead ore and blende in promising mineral ground, and the end letting out a feeder of water.—New Shaft: The 225 yard cross-cut, west from new shaft, is now being pushed on with all possible speed to lay open the Park vein, which was expected to reach in a week or nine days; this will also make a direct communication with the Wray level and in the veins southward from this shaft. The new south vein in the end of Minera level (235 yards from the surface) is 4 to 5 ft. wide, composed of black cherty rock and spar, with a good mixture of blende and lead ore, very promising for an early improvement. The tribute bargains throughout the mine are producing fair quantities of ore, and the prospects, on the whole, very encouraging. We sold on Friday last 30 tons of lead ore and 20 tons of blende, realising 372s. 15s., and have 90 to 100 tons of calamine on the mine ready for sale.

PARYS MOUNTAIN.—T. Mitchell, Oct. 24: We have nothing new to report in the 90 south this week; the ground continues to look much the same as for some time past, intermixed with small veins of mineral. Saturday next will be a quiet day.

PATELEY BRIDGE.—Charles Williams, Oct. 24: In the 30 east, on Rake vein, we have cut into a large fissure or cavity, from which a strong stream of water is issuing out, carrying with it large quantities of vein-stuff and small prill of ore; and, judging from this very favourable indication, an important change for the better may soon be expected. The vein in No. 2 slope, in the back over this level, 20 fms. east of engine shaft, is 4 ft. wide, and worth 1½ ton of lead ore per fm. A tribute pitch in the back of ditto is worth 16 cwt. of lead ore per fathom. A tribute pitch in string under east is worth ¾ ton of lead ore per fathom. The Rake vein, in the 20 east, is 4 ft. 6 in. wide, consisting of fluor-spar, gossan, and good stones of ore occasionally, and very promising. The Lump vein, in the 20 west, is from 4 to 5 ft. wide, producing fine boulders of lead ore, worth 12 cwt. per fathom. The tribute pitch in Fielding's vein is worth 1 ton of lead ore per fathom. The vein in Pringap level is 6 ft. in width, consisting of quartz, carbonate of lime, gossan, and good branches of ore, and improving. We sold on the 18th inst. 25 tons of pig-lead (exclusive of dues) for 362s. 10s. Smelting is proceeding favourably.

PEN HALLS.—S. Bennetts, P. Vian, Oct. 19: The north part of the lode in the 70 east end is not so tiny as last reported; at present worth 5s. per fathom. The west end on the same section of the lode is worth 7s. per fathom. The 60 east end is worth 6s. per fathom. The 55, east on the south part of the lode, is worth 7s. per fathom, and the 48 west 7s. per fathom.

PENNANT.—Oct. 24: We have weighed out 6 tons 10½ cwts. of lead, nearly all from our new discovery.

PENSTROTHAL.—W. Polkinghorne, Oct. 24: The ground in the 85 fm. levels, driving east and west of Highburrow shaft, is much the same in character and appearance as last reported. The lode in the 72, driving west of Highburrow shaft, is 3 ft. wide; within the last few feet driving we have met with a small east-south-west, which has changed the character of the lode; it is not so good for copper, but producing good work for tin. In the rise in the back of the 72, west of shaft, the lode is 3 ft. wide, and yielding about 1½ ton of copper ore per fathom. The lode in the rise in the back of the 72, east of shaft, is small and of no value. The lode in the 34, driving east of Highburrow shaft, is 2½ ft. wide, and worth for tin 6s. per fathom; a very promising end. In the 46 cross-cut, driving south-west of Highburrow shaft, we have met with nothing worthy of remark since last report.

PRINCE OF WALES.—John Andrews, Oct. 23: The tributaries in the back of the 24 are working on much as usual, and are still raising silver ore, but there is little or no change in the pitch from week to week. The assay of the tributaries' silver ore gives 770 ozs. of silver to the ton.

ROMAN GRAVELS.—A. Waters, Oct. 24: Good progress is being made in sinking the new south engine-shaft below the 110 fm. level. The 110, north of new south shaft, is in a strong, wide lode; worth 1½ ton of lead ore per fathom. The 95 south of shaft, is in a lode 2½ ft. wide; worth 1 ton per fathom. The 95 south is opening out a strong, wide lode; worth at present 3½ tons per fathom; prior for driving with boring-machine, 9s. 10s. per fathom. We are stopping in back of this level, south of Nos. 1 and 2 winzes, in a lode worth 3 tons per fathom. The stopes in this level, south of Wilkie's and Matthew's winzes, are yielding ore in profitable quantities. The 65 south is in a wide lode, the part being carried worth to day 2 tons per fathom. The stopes in back of this level are yielding their usual quantities of lead ore. We are sinking a winze in this level at present by the side of the lode and rich course of ore. We shall get into the lode in a fathom or two further sinking. We have at present to avoid interfering with the tramroad. This winze is going down in front of, but in readiness for the coming up of, the 80 fm. level. There is no change in the 40 south for the last week or two. No other change in the mine worthy of remark. The 150 tons of lead ore sold to date are realised 1804s. 10s., and 30 tons blends 78s. 10s.

SAINT PATRICK.—William Francis, Oct. 22: The cross-course in the 120 yard level north still holds to the westward, and is filled with friable clays, mixed with spar and gossan and other matter of the most kindly description. The chert driving in the 60 north shows some signs of coming into easier ground for driving, and is still in good bearing measures for ore.

SOUTH CONDURROW.—W. Rich. W. Williams, H. Abrahams, Oct. 23: The rise in the back of the 93 east is worth 20s. per fathom. The rise in the 93 west is worth 12s. per fathom. The 80 east is unproductive. A rise in the back of this level is worth 15s. per fathom. We are pushing on the 70 east to communicate with rise referred to; the end is yielding low quality tintstone. The 70 end, west of Plantation shaft, is worth 8s. per fathom. We have commenced to sink this shaft below the 70; the lode in the bottom is worth 10s. per fathom. The rise in the back of the 60 east is unproductive, but the lode looks promising to improve. The winze in the bottom of the 50 east, over the rise mentioned, is worth 6s. per fathom. The 50 end, east of King's, is worth 10s. per fathom. The 50, west of King's, is worth 8s. per fathom. The rise in the back of the 50 west is worth 30s. per fathom. The 50 end west, towards Plantation shaft, and the 50 east of this shaft, are both being driven on the north part of the lode in easy ground; these ends at present are yielding very little tin. The 50 end, west of Plantation shaft, carries low quality tintstone. The 40, east of engine-shaft, is worth 5s. per fathom. The 40 west is worth 6s. per fathom. The 30, west of engine-shaft, is unproductive. The 30 east is worth 9s. per fathom.

SOUTH DARREN.—Henry James, Oct. 24: Setting Report: To cut ground for the cistern at the 100, fix lift in same, timber up and make trip-lodge, put in the necessary timber at the 90, divide down the shaft, and put in the skip-road from the 90 to the 100, by nine men, for 40s. The 100 end, west from shaft, to drive by six men, at 9s. 10s. per fathom; the lode is 18 in. wide, worth 18 cwt. lead ore per fathom, and improving. The 100 end, east from 90 winze, to drive by six men, at 10s. 10s. per fathom; the lode is worth 40s. per fathom. The 100 end, west from winze, to drive by four men, at 10s. 5s. per fathom; the lode is worth 40s. per fathom. The 90 to drive west, by six men, at 9s. 10s. per fathom; this end is driving by the side of the lode, one still showing close to the end, but it is not quite so rich as it has been; the value will be given when it is again taken down. No. 1 stope, in high back, by four men, at 3s. 5s. per fathom; the lode is worth 40s. per fathom for width of lode. No. 2 stope in back, east from winze, by four men, at 3s. 15s. per fathom; the lode worth 25s. per fathom. No. 3 stope in back, west from winze, by four men, at 3s. 17s. 6d. per fathom; the lode here is of very fluctuating character, and the present value 40s. per fathom for width of lode. The 80 end men are taken back in the level to drive through a flat joint—the point where the lode is disturbed—by four men, at 6s. per fathom. No. 1 stope in the back of this level, east from winze, by four men, at 3s. 5s. per fathom; the lode is worth 20s. per fathom. No. 2 stope is suspended. The cross-cut to shaft in the 70, by two men, at 7s. 10s. per fathom. The trammimg of stuff to shaft, by six men, at 8s. 6d. per 100 skips. The filling of the skips, by six men, at 7s. 6d. per 100 skips. The drawing and handing, by four men, at 7s. per 100 skips. The drawing and dressing progressing satisfactorily.

SOUTH DERSBY MOUNTAIN.—Thomas Bennettts, Oct. 24: In the No. 1 adit the men are making fair progress in driving the cross-cut towards the large lode. In the No. 2 adit the men are making good progress in driving by the side of No. 1 lode; the end is very wet. The rise in the back of No. 1 adit is communicated to surface, which has well ventilated this part of the mine, and as soon as the men have completed the timbering we shall commence stripping down the No. 1 lode. The large lode is looking well, especially in the bottom part of the lode, which speaks well for deeper levels; we have always had the better lead in the bottom part of the ends.

SOUTH ROMAN GRAVELS.—John G. Powning, Oct. 24: Since my last report we have been obliged to put larger pipes from boiler to surface to take the smoke away. We have also fixed the necessary door in levels to command the draught, and have again started the engine to work. I am glad to inform you that we seem to have overcome the smoke difficulty. The water will soon be out of wind, and the men sinking. I will write particulars as soon as depth as attained.

SOUTH TOLCARNE.—Wm. Rich. James Knotwell, Oct. 23: The lode in the 24 end west is fully 2 ft. wide, composed of fluor spar and stones of copper. The lode in the 30 end east is gradually increasing in size, and carries spots of ore.

TALYBONT.—T. Granville, Oct. 22: North Side of Mountain: The lode in the shaft, west of new shaft, is 2 ft. wide, and will yield 10 cwt. of lead ore per yard. In the adit level, west of new shaft, and driving towards the shaft above mentioned, the lode shows indications of an early improvement. In the breast of the level we have spar and a strong mixture of lead ore. The rise in back of adit level, east of new shaft, will produce 5 cwt. of lead ore per yard.

TANKERVILLE.—A. Waters, Oct. 24: Watson's shaft is now 8 ft. below the 200, the country rock being of a congenital character, well mixed with branches of limestone, which from their position look like droppers to the lode. The 200 west is driven 6 fms. 4 ft.; lode 4 ft. wide, worth 1 ton per fathom. There is hope to meet with a large cavity soon. The 200 east is driven 14 fms.; lode 2 ft. wide, and worth 1½ ton lead ore per fathom; this end is now within 3 fms. of the line of No. 2 winze. The stope in back of this level, east of shaft, is worth 2 tons per fathom. No. 2 stope east is worth 2 tons per fathom, and No. 3 stope is worth 2 tons per fathom. The stope west of shaft is worth 1 ton per fathom. This bunch is about 24 fms. west of shaft at the said 192, and will be met with in three stops in back of the 192 west are worth together 3 tons per fathom. The 92 cross-cut, south from old lode, is driven about 10 fms., the last 3 ft. being through a kindly sparry ore lode, which is almost, if not quite, in the line of the Tankerville lode proper. We shall drive east on the lode here forthwith, and hope to be able to speak of its value next week. The tribute pitches as for some time past.

TAN-YR-ALLT.—John Davis, Oct. 24: The end on the 22 north is improving; with a little lead—not yet to value. The No. 1 stope has improved greatly as we rise, the lode being about 5 ft. wide between two well-defined walls, with a solid rib of steel ore about 15 in. wide, the whole of the rest of the lode being good for the crusher. In fact, we cannot take the lead the men have already broken away, as there would be nothing for them to stand on without we put in another bungy. We shall sample 10 tons on Saturday. The dressing and pumping machinery is working well; water plentiful.—Setting: The No. 1 stope, at 2s. 10s. per fathom; north 3 tons to a fathom—say 27s. at present prices. The 22 driving north, at 2s. 10s. per fathom. The stope in the 12, at 2s. 10s. per fathom; north 26 cwt. to a fathom—say 12s. We shall commence to sink to the 30 on the 1st of next month.

TEMPLE.—Oct. 23: There is no change to report in the appearance of the lode in either of the levels. At surface the works are progressing as rapidly as the weather will permit. Several violent storms have occurred during the past week.

VAUGHAN.—Oct. 23: The cross-cut south at the deep level east was extended during the past month 1 fm. 5 in. through wet and stiff ground for exploring; the lode in present end is a little easier for driving, being composed of a light clay slate and carbonate of lime; unproductive for lead ore. The 30, west of cross-cut on south part of lode, has been driven 2 fms. in a productive lode, yielding on an average 15 cwt. of lead ore per fathom, while in the present forecast the lode is disordered by a cross-joint and become unproductive, which we hope to be only temporary. The stopes throughout the mine are without change to notice.

WEST CRAVEN MOOR.—David Williams, Oct. 24: Blackhill Level: I have set a party of men to cross-cut south from the end of this level to intersect the ore-bearing part of the vein, which is still on that side of the level. In the rise in the back of the 42 we just intersected the vein above the flat lode, which at present is 4 ft. wide, filled with gossan and solid rocks of galena; worth 20 cwt. per fm., and promising for a further improvement. The stopes throughout the mine are of the same value as reported in my last. We have a parcel of ore in course of smelting at the mill.

WEST GODOLPHIN.—John Pope, Oct. 23: In the 80 we have commenced to open west on Wilson's lode, which is of great width, and producing some very rich stones of tin. It appears to be improving as we are getting away from the caunter. We are also breaking some very good tintstuf in the winze in the 70 west. The other places are as last reported. The weather is getting very showery, so I am in hopes we shall soon have an increase of water for our stamp, which is as little now as it has been for the summer. I am hoping to be able to report something very good in the 80, also in the winze sinking in the 70 at an early date.

WEST PATELEY BRIDGE.—D. Williams, Oct. 24: In the 20, east of shaft, the vein is 3 ft. wide, producing branches of lead ore worth 15 cwt. per fm. A stope in back of this level is worth about 10 cwt. of ore per fathom. In the 28 east the vein has further improved, being at present 2 ft. wide, and producing branches and patches of lead ore of good quality. In the 28 west we have just reached the north and south vein, upon which we have commenced cross-cutting south, to get under Discovery and No. 1 shafts. Craven Cross shaft is down 52 fms. below the surface. I hope in another three or four yards further sinking to cut the vein. The 56 is within 27 fms. of the shaft, in a vein 4 ft. wide, and producing saving work for dressing of good quality.

WEST ROSEKAR.—H. Stephens, W. Bennettts, Oct. 24: The lode in the 36 west is much the same as last reported, driving by six men, at 3s. per fathom. The 36 east, on caunter lode, produces a little blende. Here we expect an improvement soon. Driving by six men, at 5s. per fathom. The lode in the 24, driving west, is improving, containing good stones of silver-lead, with a great quantity of muriate; driving by six men, at 3s. per fathom. Stephens shaft, contains a good mixture of copper and lead, with fine rocks of tin, opening good tribute ground; driving by six men, at 4s. per fathom.

WEST TANKERVILLE.—Arthur Waters, Oct. 24: The 88 south is going forward in a strong lode, worth at present 1 ton of lead ore per fathom. We are leaving a portion of the lode on the footwall side of the drivage, which we shall shoot down this week, and hope to find it productive. The first two stopes in the back of this level, south of winze, are at present in a poor floor, the lode only yielding stones of ore. We shall get into more productive ground as we go forward. No. 3 stope is worth 1 ton per fathom. The stope in bottom of the 63 south is worth ¾ ton per fathom. The stope in bottom of the 50 south is also worth ¾ ton per fathom. By this post we send out samples of 20 tons of lead ore for next week.

WEST VOR.—S. Harris, Oct. 25: During the past week we have sunk the shaft 3 ft.; the lode continues about the same as last reported. In the rise below we have raised 4 ft.; the lode still produces stones of tin. We are making fair progress.

WEST WHEAL TOLGUS.—Oct. 22: The ground in Taylor's shaft is much the same as last reported, and our progress in sinking just the same. The rise in the back of the 145 is now communicated with the No. 3 winze under the 135 west shaft, and the men will now commence to drive the 145 end west from the rise; the lode is all the width of the end, and will yield about 1½ ton of ore per fathom. The end is to be driven at 7s. 10s. per fathom for two months. No. 1 cross-cut, in the 145, west of the shaft, is being driven by the side of the cross-course in disordered ground. We shall turn to drive east through the cross course in a day or two. The lode in the end west of No. 2 cross-cut is yielding about 1 ton of ore per fathom, and the end driving east from No. 3 cross-cut is yielding 3 tons of ore per fathom; these ends are on the south part of the lode, which we expect to communicate by next setting day. There is very little alteration in the stopes in the back of this level. The lode in the 135 west is just the same as last reported, yielding 2 tons of ore per fathom; there has not been much of it taken down this week. No. 3 winze is held to the rise from the back of the 145, and the men are put to clean up the level; and before the end of the week they will begin to sink No. 4 winze. The western stope in the back of the 135 is yielding very well; this stope is west of little cross-course, and over the place where we shall sink No. 4 winze. The ground in Richard's shaft is without much alteration; the branches continue to yield a little ore. The lode in the 65 end west is small and poor; the killas continues dark coloured.

WHEAL AGAR.—Wm. Hamby, Edward Moyle, Oct. 24: The engine-shaft has been sunk 4 ft. under the 215, and a cross-cut extended 2½ fms. north to Waddington's lode; here we have just cut into the south part of the lode, and have some rich stones of tin; in the course of a few days we shall, no doubt, be able to report a lode equal in value to that in the stope above; driving by twelve men, at 10s. 10s. per fathom. The 205 has been driven 20 fms. east; the first 10 fms. through a lode worth 60s. per fathom, from which point to the end we have value at an average of 10s. per fathom. This end now driving by four men, at 11s. per fathom, making good progress. We have a stope west of shaft working by 27 men, at 20s. per fathom, from the 45 to the 80 under the same. A cross-cut is being driven at the 120, west of the 215; the lode here is about 2 fms. wide, and worth for its width, at the present low price of mineral, full 80s. per fathom. We have stopped nothing east of the shaft, where we have a very rich lode. As soon as the sump-winze, now down 5 fms. below the 205, is held to the cross-cut at the 215 we shall reduce the number of men stoking, and the price per ton. The rich course of tin has lengthened from 4 fms. to 10 fms, at the 205, and we anticipate an increased length in proportion at the 215. The whole of the ground stoked since last meeting has been about 6 fms. on the length of the lode, and has produced 2827 tons of tintstuf (173½ tons of black tin), which has realised, in the stone, \$2138s. 88; bar No. 5, 1394 ozs., value \$1719s. 37; total, \$5732s. 47, less discount 14 per cent.

WEST VOR.—Oct. 7: Exploratory Works: The level south of the Troy winze is without change. In the Frances Mine, driving south, we have cut a very nice little branch off the head. The result was 65 ozs.—approximate value, \$10,500. I have now perhaps \$2500 or \$3000 left in the flumes not cleaned up. We now have bed-rock and cuts to clean in, which will consume about four weeks, and should yield a handsome profit, the only expense being the labour, which is very trifling when compared with the cost of powder and water. I am at present very busy getting ready for making full repairs on the ditches, &c. I hope to be able to remit you nearly what you require at the final clean up. It will be necessary to put in new iron pipe on main ditch. The cost will be \$1800 or \$2000. Also a new receiving tank at the head. There is nothing of much further interest at this time that I can recall.

MARSHALL HILL.—Mr. Plummer, Sept. 30: Exploratory Work: The Troy winze is without change, and after a thorough examination of Clarke's workings I did not consider it advisable to do any work there on account of its poverty. I therefore removed the men to the South Troy Mine to drive south into the new property.—Burrows: The Indians are coming back again, but too late to be of any material value to us, as the mill will soon gather on them.—Mills: We are making fair progress with the ores under treatment, but in richness or working percentage they do not come up to our expectations. We have finished the tributaries, and they are greatly disappointed at the result of their working. Closely assorted ore that is expected to yield from \$500 to \$700 did not yield more than from \$300 to \$450 per ton. All the ore found by them and the company have been for some time getting poorer, and the only way I can account for it is that the ore being chiefly found in strings, branches, and feeders, with an occasional pocket, and being as it were on the outskirts of the main lines of the ore bodies proper, and every year getting further and further away from them, have not the same strength and purity of composition that the parent bodies had, but parts of the foreign and refractory elements surrounding them, and these refractory elements have their effect in the pan room. To date we have hauled from the Hill 440 tons, and are now getting more plentiful. To-day I shipped to the Bank of California on account of the company—Bar No. 3, 1495 ozs., value \$1814s. 02; bar No. 4, 165 ozs., value \$2138s. 88; bar No. 5, 1394 ozs., value \$1719s. 37; total, \$5732s. 47, less discount 14 per cent.

WHEAL SEYREE CREEK.—G. S. Powers, Sept. 21: The South Yuba water was turned off on the 23rd inst., and I cleaned about one half the sluice, commencing at the head. The result was 65 ozs.—approximate value, \$10,500. I have now

some of the coal from the fire; I estimate it at 55,000 bushels, which is quite an item, and will reduce the amount of loss by about \$15,000. I am having all the debris cleared away, so as to be ready to rebuild as soon as I receive your cable in answer to mine regarding the reconstruction on a plan more economical for working or rebuilding on the debris the same as before. By building the furnaces north and south it will be much more economical for working; there will be a great saving in labour, also in fuel to work the machinery, as the machinery placed there was a great loss of power. I am expecting your cable to day, I shall have everything ready to give the order for lumber and iron as soon as I get it, so there will be no loss of time in getting the material for the house. I have stone-cutters at work cutting the stone necessary for the lining to replace the stones broken by the fire. I think that two months will suffice for the erection of the furnaces, and getting at least two furnaces ready for operation. The air compressing machinery is completed, and will enable us to push on the dead work in the lower levels with greater speed than it was possible by hand labour.

developed in  
capital,  
St. John  
Velho state  
amount is a  
days since.  
The Nove  
held in Fr  
from Vene  
the agent s  
to start th  
engineers  
would reac  
receives rep  
covery of fre  
quantity of p  
Richmond  
is a report  
general imp  
fissure was  
on quartzite  
west drift th  
machinery  
Tuesday, an  
drilled the f  
They will no  
with greater  
In the Sie  
inslaine, take  
one might h  
mora. The  
was first  
distance; it  
station will  
Crestock min  
Nerada—richer  
promises well,  
trust of low-gr  
holly. The No  
joined shaft w  
47, which clo  
at the time on  
cues-cuts at sm  
The Marke  
and Marke  
bounce the fi  
to attack any  
season. Bird  
some very fa  
in course of c  
Haltfall, 2  
gard to the  
congratulated  
new metallur  
treatment of  
practical diff  
and some of  
sizable perc  
dressing, so th  
is question, the  
Journal, who  
profitably trea  
each thorou  
of such an inv  
would appear  
Lead Mines  
a fair amount  
is no change n  
is usual. Gro  
in the best pos  
Valley, 2 to 2  
meeting is to  
fatisfactorily, a  
meeting. Red E  
Frongoch, 2 to 2  
has been acquir  
capital for wor  
Mineral Corpor  
encouraging char  
far beyond their  
expectations, a  
and never expect  
and has improv  
given ventilation,  
keeping for lead  
it is as fine a  
wife on the south  
Pont-y-Mwyn  
from the Modyn  
shaft from whic  
Paledy Bridge,  
ent into, and an i  
gaining a very  
spes without ch  
Mawdon, 60 to 65  
Sbjointed ar  
Ashton, 3 to 4;  
to 4 to 5; East Va  
Marie Valley, 3 to  
Penstruthal, 3 to  
to 5; Van, 15;  
Paledy, 2 to 2 1/2;  
Cwm Creek, 3 to  
to 3 1/2; Chon  
to 2 1/2; Eberha  
Fronton and Bol  
to 2 1/2; Kapang  
ong Preference,  
2 1/2, to 3 1/2;  
Blaen Buttes, 1 1/2

COLLIERS.

and, and polit  
share mark  
siller shares,  
the trade of th  
is wondered at,  
and a favorable  
A few of al  
selves, making  
part of their sh  
in the coal trade  
sarily in demand.  
The Lancashir  
ellers are work  
fallery is in full w  
completed and  
the output may  
a slight in rev  
per week. A fe  
use 3 to 3 1/2%.  
are Abercarn, 4 to

With this v  
which contain  
Australian Tin  
Mining and Q  
Drills—the Ed  
—An Entirely  
Great Northern  
sols, R. Symon  
panies—Miner  
lurgy—Mineral  
Duck, or Spoo  
duging, Sulphur  
Parent Mattera  
South Wheat C

COURT GRANG

in inst., fetchin

lead and

ATELEY BR

ort communica

beam of water i

and small pr

ay be expected

opening upon

## TO THE METAL TRADE.

FOR COPPER, TIN, LEAD, &c., apply to—  
MESSRS. PELLY, BOYLE, AND CO.,  
SWORN METAL BROKERS,  
ALLHALLOWS CHAMBERS, LOMBARD STREET, LONDON.  
(ESTABLISHED 1849.)

## The Mining Market: Prices of Metals, Ores, &amp;c.

METAL MARKET—LONDON, OCT. 25, 1878.

IRON.	£ s. d.	£ s. d.	TIN.	£ s. d.	£ s. d.
Pig, g.m.b., f.o.b., Clyde.	2 3 9 —	—	English, ingot, f.o.b.,	61 0 0 —	61 0 0 —
" Scotch, all No. 1 ...	2 5 6 —	3 10 0	bars	62 0 0 —	62 10 0
Bars, Welsh, f.o.b., Wales	5 0 0 —	—	" refined	63 0 0 —	63 10 0
" in London	5 10 0 —	5 15 0	Australian	56 10 0 —	—
" Stafford,	6 10 0 —	7 0 0	Hanca	59 0 0 —	—
" in Tyne or Tees	5 5 0 —	5 10 0	Strals	55 10 0 —	57 0 0
Swedish, London	8 15 0 —	9 5 0	COPPER.		
Rails, Welsh, at works,	4 15 0 —	—	Tough cake and ingot	62 10 0 —	64 0 0
Sheets, Staff., in London	8 5 0 —	—	Best selected	63 10 0 —	65 0 0
Plates, ship., in London	6 15 0 —	—	Sheets and sheathing	68 0 0 —	—
Hoops, Staff.	7 5 0 —	7 10 0	Fiat Bottoms	71 0 0 —	—
Nail rods, Staff., in Lon.	6 0 0 —	6 10 0	Wallaroon	68 0 0 —	(nom.)
STREEL.			Burra, or P.C.C.	67 0 0 —	—
English, spring	13 10 0 —	19 0 0	Other brands	64 0 0 —	65 0 0
" cast	30 0 40	0 0	Chili bars, g.o.b.	56 10 0 —	—
Swedish, key.	14 0 0 —	—	PHOSPHOR BRONZE.		
" fag. ham.	15 0 0 —	—	Bearing metal	£105 0 0	—
LEAD.			Other alloys	£110 0 0 —	125 0 0
English, pig, common	15 5 0 —	—	BRASS.		
" L.B.	15 10 0 —	—	Wire	7 d.	7 1/2 d.
" W.B.	16 0 0 —	—	Tubes	7 1/2	8 1/2
" sheet and bar.	16 5 0 —	—	Sheets	8	8 1/2
" pipe	17 0 0 —	—	Yel. met. sheath. & sheets	5 1/2	6 1/2
" red	18 5 0 19 0 0	—	Nails composition	8	8 1/2
" white	24 0 26	15 0 0	TIN-PLATES.*	per box.	
" patent shot	19 10 20 25	15 0 0	Charcoal, 1st quality	1 0 0 —	1 2 0
Spanish	14 15 0 14 17 6	—	" 2nd quality	1 0 0 19 0 1 0 0	—
NICKEL.			Coke, 1st quality	16 0 0 —	—
Metal, per cwt.	18 0 20 0 0	0 0	" 2nd quality	14 0 16 0 16 0	0 0
Ore, 10 per cent. per ton	24 0 26 0 0	0 0	Black	18 0 0 16 10 0	0 0
QUICKSILVER.			Canada, Staff., or Gla.	11 0 0 12 0	0 0
Flasks of 15 lbs., ware.	6 15 0 —	—	at Liverpool	11 0 0 12 0	0 0
SPETERL.			Black Taggers, 450 ft.	30 0 0 —	—
Silesian	17 2 6 17 5 0	—	For the week ending Oct. 19, 1878.	Tons	9,994
English, Swansea	17 10 0 17 15 0	—	For the week ending Oct. 20, 1878.		8,956
Sheet zinc	21 10 0 22 0 0	—	Increase	1,038	
* At the works, 1s. to 1s. 6d. per box less for ordinary; 1s. per ton less for Canada; IX ds. per box more than 10 quoted above, and add 6s. for each X. Term-plates 2s. per box below tin-plates of similar brands.	14 10 10	—	Total decrease for 1878	52,991	

**REMARKS.**—Our markets have been unsettled on account of the tremendous strain brought to bear upon them by so many disastrous failures, amongst whom we are very sorry to note are some firms who have been closely connected with the metal trade. The past week has been an anxious one, and exceedingly gloomy and barren in its results. Speculation has almost ceased, and the restrictions of trade generally have become still more restricted. The feeling of distrust if anything appears to have spread rather than diminished; nevertheless, it is hoped that the worst troubles are over, although the end of them may not yet have been reached, and it will doubtless be necessary to observe extreme caution for some time to come. Rumours are still continually being circulated about certain houses of doubtful standing who are supposed to be involved, and while these apprehensions last the public mind cannot be at rest. It is needless at this time like the present to aggravate the evil by exciting apprehension without sufficient foundation; at the same time, people cannot be too circumspect in giving credit, and should endeavour whenever practicable to curtail their liabilities. The uncertainty which exists at the moment respecting commercial and financial affairs forbids any reliance being attached to the stability of markets, and as they are now subject to extraordinary pressure, and ordinary rules lose their force, prices are liable to violent fluctuations, and those of to-day may be very different to those of tomorrow. Business in all departments is stagnant, and prices nominal, and there is no dependence upon the one or the other.

It is most unfortunate that the interruptions to business should now be taking place, for trade, in some branches, was just recovering, and last month began to show very favourable returns indeed, and prospects had considerably brightened; but it is evident that the improvement came too late to prevent the crash, and all the advantages which would otherwise have been reaped are lost for a season. The general resuscitation is consequently postponed, and it will be necessary to wait the issue of events, and to ascertain the full measure and extent of the calamity before any particular movement or progress can be made. At the loss of business it is, perhaps, better to maintain reserves; and this is what the banks, and merchants, and all prudent houses, are doing at the present critical period. This the time, however, for capitalists and investors to step forward and buy, for they have an excellent chance of making immense fortunes out of other people's misfortunes. Prices are unduly depressed, and in some instances unprecedentedly low. The security, in the shape of warrants, can be looked up in their own cash-boxes, and all they have to do is to quietly abide their time for realising. It is true they may be getting a good rate of interest for their money, and do not care to disturb it; but exceptionally high rates of money rarely last long, and as soon as the crisis is over money will undoubtedly become cheaper; for there are no trade demands to uphold it, and whenever the end of the difficulty can be clearly discerned, and the Bank rate is reversed, the prices of metals may be fully expected to advance; for no one would dream of selling at current rates unless forced to do so, or enabled to cover on more advantageous terms. It is, therefore, a mere question of time as to when our markets will right themselves; they have hitherto had a succession of drawbacks to encounter, for no sooner have they been extricated from one disaster than they have been overtaken by another. We trust that the present evil may prove the last; and there are certainly fair grounds for assuming that it will be so, or at least that no corresponding evil of gigantic magnitude will soon again threaten us; and the experience of the past will not be lost if men would but see the absolute necessity of observing greater caution and keeping within reasonable bounds for the future. There are plenty of good things in store for us all, but they are lost sight of and forgotten amidst the prevailing troubles and anxieties.

Whatever difference may exist among us in our political opinions, the Government have for once united and entire approval of the prompt action they have taken in arresting the board of directors and the head officials of the Glasgow Bank, for after such startling revelations as have been recently published by the examiners and investigators of the bank's accounts it would have been a scandal if such men were not brought to justice and made to answer for the sufferings they have inflicted so unmercifully upon the poor helpless orphans and widows. It is evident that our commercial laws are far too lax, and they require a thorough revision. Hitherto there has been too great a facility afforded to dishonest traders to evade the law, and this must be stopped for the future, or else the credit of the country will suffer. The honour of England is at stake, and it must be maintained at all costs. All who take credit ought to be bound to show, in the case of insolvency or bankruptcy, afterwards that they were at the time of taking credit in a position of making good their engagement, and, in the event of their failing to do so to the satisfaction of the Bankruptcy Court, to be committed to take their trial for fraud.

The law must be made severe, and it must be enforced, for however severe the law if it is not enforced it is dead and powerless, and we shall be constantly having a repetition of the recent disgraceful and heartrending disclosures. Commercial men must be content to limit the extent of their transactions, and confine them within reasonable amounts, and in proportion to their capital. There will be no security to the honest trader until it is known that anyone accepting credit under false pretences will be visited with the utmost rigour of the law, and that law should be the forfeiture of all property, and no commutation or final release before the whole liabilities have been honourably paid in full. Severe cases require severe remedies. The innocent are not afraid of laws, as they are made for their special protection and benefit. The law is only intended for the lawes and the pests of society. Let us have honest and just dealings with one another and there will be nothing to fear from the terror of the law. The terms of purchase for some metals are much more stringent than formerly, and it would be better that the whole trade adopted one principle—namely cash payments against notes, receipts, or delivery orders; let the banks do the rest of the business. The merchants do not object to the terms in copper, which is one of the dearest, and generally runs into most money, and, therefore, if all other sellers would follow the example of the copper smelters in this respect there would be very few losses incurred by way of bad debts. The percentage of profit on commission is now so very small that business does not admit of the slightest risk.

**COPPER.**—An immense sensation was created in our market last Saturday upon the announcement of the failure of Messrs. James Sawyers and Co., known to be very largely interested in this metal, and intimate connections of the late Mr. Elwars, of Valparaiso. Sellers immediately offered to sell Chili bars at 56s., but no transactions were reported. Subsequently it transpired from Liverpool that the firm in question held 1,000 tons of copper, and that Mr. Edwards' interest might be endangered, in which case there might be a very severe pressure put upon the market, prices consequently again gave way, but buyers were so completely staggered that at first they declined to operate, but business eventually resulted at prices kept secret. At the same time there have been all sorts of rumours to the effect that one lot of 1,000 tons, and another of 500 tons had been turned over at 54s., and even 53s. The latter appears to be somewhat doubtful, but the former is asserted in a more positive manner. We do not vouch for either statement, but whether they are correct or not it is a matter of little moment to the public, for they would be arrangements of a special character, and, therefore, not affecting the general quotation. The committee on Thursday reported the nearest value of Chili bars at 58s., and as they have not referred to the business rumour at the lower prices, the assumption is that they are wanting in confirmation, or that they attach no importance to them.

But it is no great matter after all whether 15 tons of copper has been disposed of at a lower rate, for if that is a portion of the 9000 tons, then what is to become of the remaining 7500 tons. It is the disposal of the balance in which buyers are more particularly interested, or, if the 1600 tons do not form part of the 9000 tons, then what arrangements will be made with regard to this quantity. Of course a sale of 1600 tons outside of the 9000 tons would reveal weakness elsewhere, and

there would still be the full 9000 tons to deal with hereafter. While any doubt remains about the subject the market will continue undecided, and the matter should be cleared up as quickly as possible. The trade would be perfectly satisfied if they knew that the market was safe from any forced sales, and it would be the height of folly to sell copper at these ridiculously low prices for any other reason than that of actual necessity, but although buyers may be aware that the present value is below cost of production, yet that affords them no security against a lower price if there is a large quantity of copper in weak hands which must be realised, and naturally enough they wish to be guarded against buying on a falling market. To restore confidence it is necessary that some reliable statement be made in regard to the bankrupt's stock of copper. It must be sold there are buyers ready to take it all up at a price, and the sooner it is all disposed of the better. On the other hand, if it is not for sale it would be a great benefit to the market to have it published, in order to dispel the present fears and apprehensions of buyers.

**IRON.**—The demand is extremely limited, and prices for manufactured are easier. English and Staffordshire qualities are reduced about 5s. per ton. English merchant bars are now procurable at 5/- 10s., forward delivery, and Staffordshire ordinary best 7/- f.o.b. London, common brands 5s. to 10s. per ton less. Swedish bars are also slightly lower. The fall in the Indian rate of exchange makes a great difference in the number of orders given out, and the works must be further concessions there will be scarcely anything doing for India for a long time to come, but the works will not only be badly off in regard to Indian orders, but the season is now so rapidly drawing to a close that it will very soon be too late to effect shipments to the northern ports, consequently in about three or four weeks the demand will be on the decline, as the export trade will have considerably diminished, and by the end of November we shall be entering upon the dullest part of the year, and December invariably proves a slack month for iron, for not only is the weather at that time against all outdoor work, but consumers do not care to order for stock until after Christmas, and merchants prefer letting the year run out before making fresh contracts of any magnitude.

The immediate prospects are, therefore, unfavourable for this metal, especially as, in addition to ordinary influences of a depreciatory character, there is the great shock to, and awful collapse, of commercial credit, which must be taken into account, and the severe check thereby given in the legitimate and speculative demand. The shipments of Scotch are larger this week than they were at the corresponding week of last year, which is so far an encouraging feature, but would probably not have happened if prices had not been so much reduced. Any advance in prices would most likely at once destroy the improvement, but as makers' iron is said to be still tending downwards there is no fear of speculation doing any mischief. As long as makers will meet the demand, and it is very important that there should be no obstacle thrown in the way of shipments just now, otherwise the opportunity of sale will be lost for the season. Speculators can do harm only to themselves, which is of no consequence to the trade. Every facility should be afforded shippers to execute orders, and shipments should be pushed forward as fast as possible. There is evidently hard times to be borne by the iron trade, and the ensuing winter will, doubtless, be a very trying one to all parties. As there is little or no hope of amendment, it would be better to prepare for the worst, and make suitable arrangements to meet the altered state of affairs, as it uses to attempt to swim against the stream. The price of Scotch pigs is now quoted 43s. 9d. m.n. cash.

**TIN.**—The immediate prospects are, therefore, unfavourable for this metal, especially as, in addition to ordinary influences of a depreciatory character, there is the great shock to, and awful collapse, of commercial credit, which must be taken into account, and the severe check thereby given in the legitimate and speculative demand. The shipments of Scotch are larger this week than they were at the corresponding week of last year, which is so far an encouraging feature, but would probably not have happened if prices had not been so much reduced. Any advance in prices would most likely at once destroy the improvement, but as makers' iron is said to be still tending downwards there is no fear of speculation doing any mischief. As long as makers will meet the demand, and it is very important that there should be no obstacle thrown in the way of shipments just now, otherwise the opportunity of sale will be lost for the season. Speculators can do harm only to themselves, which is of no consequence to the trade. Every facility should be afforded shippers to execute orders, and shipments should be pushed forward as fast as possible. There is evidently hard times to be borne by the iron trade, and the ensuing winter will, doubtless, be a very trying one to all parties. As there is little or no hope of amendment, it would be better to prepare for the worst, and make suitable arrangements to meet the altered state of affairs, as it uses to attempt to swim against the stream. The price of Scotch pigs is now quoted 43s. 9d. m.n. cash.

**SHIPS.**—For the week ending Oct. 19, 1878.

For the week ending Oct. 20, 1878.

Increase ..... 1,038

Total decrease for 1878 ..... 52,991

**Imports of Middlesborough pig-iron into Grangemouth:**—

For the week ending Oct. 19, 1878 ..... Tons 5,637

For the week ending Oct. 20, 1878 ..... 4,656

Increase ..... 982

Total increase for 1878 ..... 2,224

**FURNACES.**

In blast Oct. 20, 1878.

In blast Oct. 19, 1878.

The accounts from Sheffield still continue of the most uns

developed undertakings more of the invested capital would be applied as working capital, and the complaints of loss and disappointment would be much fewer.

St. John del Rey, 280 to 290; the latest telegram from Morro Velho states that the profit for September was 4700L. This low amount is accounted for by the drought which prevailed until a few days since.

The Nouveau Monde Gold Mining Company, which is principally held in France, announces that the directeur gerant has just received from Venezuela a letter, dated September 15, from Mr. Battistini, the agent general of the company, in which he states that he was going to start the next day for the El Dorado Mines to accompany the engineer engaged to make a report on the veins discovered, and whose report would reach Paris about November 15. Mr. Battistini adds that every day he receives reports of the fabulous riches of the auriferous districts, and of the discovery of fresh deposits. Three days before a person had arrived bringing a large quantity of gold in nuggets of the size of from 1 to 2 ozs. found in the El Dorado property.

Richmond, 9½ to 10; there has been no telegram this week, but there is a report from the mine manager to Oct. 3. The gradual and general improvement in the mine was continuing, but the 500 on fissure, was down 80 ft., and not looking so favourable. The 800, on quartzite, is in very favourable ground for working. In the 600 west drift there were good indications for ore. The air-compressing machinery having been completed, was started on the previous Tuesday, and was working very satisfactorily. On Oct. 1 they drilled the first hole in the Richmond Mine with the Burleigh drill. They will now be able to push on the dead work in the lower levels with greater speed than was possible with hand labour.

In the Sierra Nevada, on the Comstock, "assays of ore from the incline, taken without selection, went up to \$320. By selecting, ore might have been obtained that would have assayed \$1000 or more. The incline is down 200 ft. on the stope, below where the ore was first struck, and has proved to be rich almost the entire distance; it is within 40 ft. of the 2200 level, at which point a station will be opened and a cross-cut put out. English holders of Comstock mines will learn with satisfaction that there is but one sound from Sierra Nevada—richer, wider, deeper, and more of it, and that the Ophir development promises well, it being now evident that they are simply descending on the outer crust of low-grade ore, beneath which experts predict a large and permanent ore body. The North Bonanza and Flower Mines are to be worked by means of an inclined shaft with three compartments. It will be ran down at an angle of about 45°, which closely corresponds to the dip of the lode. By this plan they will be all the time on the east face of the ledge, into which they can at any time make cross-cuts at small expense."

The Market for Hydraulic or Gold Washing shares remains quiet, and prices are nominal. The latest advices from California announce the first rainfall of the season, but it is obviously too early to attach any importance to this as an indication of the coming season. Birdseye Creek, ½ to ¾; a report in another column gives some very favourable news as to the value of the final clean-up now in course of collection.

Haltfall, 3 t. 3½; there is nothing particular to report with regard to the progress at the mines, but the shareholders may be congratulated upon the success which has attended the trials of a new metallurgical process recently made in Belgium. Hitherto the treatment of mixed ores of lead and blende has presented much practical difficulty. It has been easy to obtain some of the lead and some of the blende each in marketable condition, but a considerable percentage of the admixture remained inseparable by the process of dressing, so that the saleable portions frequently left no profit. By the invention in question, the description of which is commenced in another column of to-day's Journal, the whole of this refractory residue can, it is said, be successfully and profitably treated, both the lead and the blende being obtained in the metallic state, each thoroughly free from contamination with the other. The importance of such an invention to all mines producing these mixed ores of lead and blende would appear to be almost incalculable.

Lead Mines have been without much quotable change, although a fair amount of business has been transacted. Van, 15 to 16; there is no change notified since last report. Everything is progressing as usual. Grogwinion, 2½ to 2¾; everything continues to progress in the best possible manner both underground and at surface. Wye Valley, 2 to 2½; West Wye Valley, 2½ to 2¾. Caron, 2 to 2½; the meeting is to be held on Nov. 4. The dressing machinery is working satisfactorily, and it is expected that a sampling will be made by the day of meeting. Red Rock, 2 to 2½; the new discoveries continue to open out well. Frongoch, 2 to 2½; active operations are about to be resumed at this mine, which has been acquired by an influential body of capitalists, who have provided ample capital for working it on a large scale.

Mineral Corporation, 10 to 11; the report from the mine this week is of an encouraging character. The manager writes that "the Hafna Mine is opening out beyond his expectations; he always believed it to be a good mining property, but never expected to find it nearly so good as it is." The lode in the No. 1 adit has improved. They have got the shaft through to No. 2 adit, which has given ventilation, and opened up a large piece of ground that will well pay for stopping for lead and blende. They have cut through the lode at No. 4 adit, and it is as fine a looking lode as anyone can wish to see. They are driving 4 ft. in the south part, all of which must be saved for the dressing floors."

Pant-y-Mwyn shares are quoted 4½ to 5; it is reported that the discovery at the Modin shaft is opening out a fresh section of profitable stoping ground, from which they will shortly be making large returns of ore.

Pateley Bridge, 3½ to 4½; in the 30 east, on Rake vein, a large cavity has been met into, and an improvement in the value of the lode is expected. The 20 east is presenting a very promising appearance. Principe vein is improving, and other points without change. West Pateley, 2 to 2½; Hartington Moor, 1½ to 2. Minton, 60 to 65.

Subjoined are the closing quotations:—

Asterton, ¾ to ¾; Devon Great Consols, par to ½ prem.; East Caradon, ½ to ½; East Van, 2½ to 2¾; Great Laxey, 15 to 16; Hington Down, ¾ to ¾; Marie Valley, ¾ to ¾; Parry Mountain, ¾ to ¾; Pately Bridge, 4 to 4½; Prastrana, ¾ to ¾; Roman Gravels, 5½ to 6½; Tankerville, ¾ to ¾; Tincroft, 4 to 8; Van, 15 to 16; West Bassett, 1 to 1½; West Chiverton, 1 to 2; West Pateley, 2 to 2½; Wheal Treville, 1½ to 2; Almada and Tirito, ½ to ¾; Birds-eye Creek, ¾ to ¾; Blue Tent, 2½ to 3; Cape Copper, 28 to 29; Cedar Creek, ½ to 3½; Chontales, ½ to ¾; Colorado United, 2½ to 2¾; Don Pedro, ¾ to ¾; Eberhard and Aurora, ¾ to 4; Exchequer, 3½ to 5½; Flagstaff, ¾ to ¾; Fontaine and Bolivia, 2½ to 2¾; Hultafors, 3 to 3½; I. X. L., ½ to ¾; Javall, ¾ to ¾; Kapanga, ¾ to ¾; Last Chance, ¾ to ¾; New Querida, 1¾ to 1½; Oregon Preference, 3 to 3½; Pestarena, 3 to 6 to 5½; Placer, 2½ to 3; Port Phillip, ¾ to ¾; Richmond Consols, 9½ to 9½; St. John del Rey, 280 to 290; Herra Buttes, 1½ to 1½; South Aurora, ¾ to ¾; United Mexican, ¾ to ¾.

COLLIERS.—Bank and commercial failures, the electric light care, and political shadows have all combined to upset the stock and share markets, and there have been scarcely any transactions in colliery shares. Under such adverse circumstances, and with all the trade of the country depressed, this absence of business is not to be wondered at, though much to be regretted, for it is a very long time since a favourable opportunity could be found for buying the shares of good collieries. A few of such collieries are now, even in the face of all difficulties and obstacles, making respectable profits, and in many cases the present market quotations of their shares do not nearly represent their intrinsic value. From Darlington, the coal trade is to be fairly active, household and gas fuel being in great demand. Derbyshire, Durham, and Yorkshire are doing an improved business in house coal, but in most other districts the coal markets are excessively dull. The Lancashire trade is in a very depressed condition, and almost all the collieries are working short time. Chapel House, however, is an exception. This colliery is in full work, and doing a very fair trade. The new engines recently completed are found to be excellent in every respect, and a considerable increase in the output may be looked for shortly. Shipments of coal from the various ports for a slight increase for the week, being about 10,000 tons in excess of the previous week. A few Llyw Hall shares are offering on the market at 6 to 8. Altarnon, 3 to 3½; Cardiff and Swansea, ½ to ¾; Thorp's Gwabar, 1½ to 2. Newport Abercarn, 4 to 4½; New Sharston, 3 to 4.

With this week's Journal a SUPPLEMENTAL SHEET is given, which contains: Original Correspondence; Tin Mining in Larut (P. Doyle); Australian Tin Mines; Tasmanian Tin Fields (R. Symons); Eclipse Gold Mining and Quartz Crushing Company; Compressed Air Machines; Rock-Drills—the Eclipse and Ingersoll (Hathorn and Co.); Innocuous Tin-Plates—An Entirely Novel Process; the Supply of Welsh Steam Coal to London—Great Northern Railway (W. J. Thompson); Pant-y-Mwyn Lead Mine (E. Carter, R. Tredinnick); Mining in Cardiganshire (S. Trevelyan); New Companies—Mineral Resources of Constantinople—Foreign Mining and Metallurgy—Mineral Resources of Utah—New and Economic Lubrication—Wild Duck, or Sportsman's Arms—Ryder's Hot-Air Engine (Illustrated)—Patent Matters—Meetings of West Prussian, Glyn, Wheal Uny, Wheal Agar, South Wheal Crofty, Javall Companies, &c.

COURT GRANGE.—This mine sold its first parcel of lead on the 1st inst., fetching 13L. 13s. 6d. per ton. The parcel assayed 76 per cent. of lead and 34 ozs. silver per ton.

PATELEY BRIDGE—GREAT DISCOVERY.—This week's official report communicates the important fact that the 30 east, on Rake vein, has opened upon a large fissure or cavity from which a strong stream of water is issuing, carrying with it large quantities of vein and small prills of ore. "Judging," says the manager, "from this favourable indication, an important change for the better may be expected." It may be remembered that some years since opening upon a similar cavity or vug in the Tankerville Mine,

in the same formation, and under analogous conditions, led to one of the most valuable discoveries of recent times.

TAN-YR-ALLT.—This little mine, which is now being worked by a private company, continues to keep up its reputation, paying cost, and even at the present low price of lead yielding a profit to the adventurers. Why the late company should have sold such a mine, with two stopes each worth at least 2 tons to a fathom, and with a shaft already sunk 8 fathoms to come under them, is wholly inexplicable; the lead alone would have enabled them without a call to have carried the mine 20 fathoms deeper, and laid open backs of rich ore, now to be seen going down in the sole of the 22. The present adventurers are preparing to sink the required distance to lay open fresh back of 10 fathoms.

WILCH UNITED MINES.—The agent, Capt. Nicholas Bray, states that the discovery of silver-lead ore continues to open up in the 60, the value of which he estimates as worth 1 ton per fathom, and equally good at both ends. The main shaft is 4 fms. below the 90, the water increasing every fathom sunk; this shows that it is in connection with a strong and porous lode.

ISABELLE GOLD AND SILVER MINING COMPANY.—Just before going to press we learn that the directors have concluded an arrangement with Colonel Beaumont, M.P., for the use and sole agency of his drills in North and South America, upon terms that will give the company a commission of 20 per cent., without the company having any risk. Colonel Beaumont, M.P., has also consented to act as consulting engineer to the company in England. Apart from the mines, the company has many sources of revenue, increasing as developed into activity.

EXCHEQUER.—The subscription-list for shares was closed on Monday, and unallotted shares will not be issued at less than 2s. per share premium.

THE ELECTRIC LIGHT.—Some practical evidence of the value of electricity as an illuminating agent was afforded at Chorley on Thursday night, when a football match was to have been played by electric light. The rain came down in torrents, but about 8000 people gathered on the grounds notwithstanding, and remained for two hours while efforts were made to light the lamps, but without success. The electrician attributed the failure to the dampness, as the electricity escaped from the wires into the ground. Strong expressions of disapproval came from the assembled crowd, many of whom came from Preston, Bolton, and Manchester.

#### INSTITUTION OF MECHANICAL ENGINEERS.

A general meeting of the members was held on Thursday, at the Memorial Hall, Manchester, Mr. JOHN ROBINSON (Sharp, Stewart, and C., Manchester), the President, occupying the chair. The PRESIDENT proposed a resolution expressing the regret of the Institution at the death of Mr. Penn, and this was unanimously agreed to. On the motion of the PRESIDENT it was also resolved that the council of the Institution should be authorised to op-rate with other societies in representations to the Board of Trade, with the view of obtaining some improvement in their course of procedure in connection with the inspection of shipbuilding, engines, and machinery, and he (the President) spoke strongly against the present condition of things, objecting to the autocratic power with which the Board of Trade was at present invested. He (the President) next made a number of announcements with regard to the decisions of the council upon certain matters connected with the Institution, and stated that the council had come to the conclusion that it was not advisable to give prizes for papers read before that Institution. This concluded the formal business of the meeting, and

The SECRETARY then read a paper by Mr. W. S. Hall, of Nuneaton, "On Drilling Machines for Boiler Work," in which the writer described the various machines and appliances now in use, which he divided into two classes, the first comprising those used in the preparation of detached portions of the work, and the second those employed after the boiler had been wholly or partially built up. Considerable difference of opinion, he said, existed amongst boiler-makers as to the most advantageous and best mode of drilling. Whilst some uncompromisingly asserted that every hole should be drilled after the plates were bent and placed together, others preferred to do the whole, or a large portion, of the work by the multiple drill, before the plates were bent. With proper care and suitable appliances the latter might, in the writer's opinion, be done with quite sufficient accuracy; but, on the other hand, a slight error in the position of a hole was of little or no consequence when both plates were drilled through simultaneously. Taking everything into consideration, an intermediate course was probably, the best—to employ the multiple drill for the longitudinal seams before the plates were bent, and to drill the circular seams afterwards, in place. The writer, in the course of his paper, described a machine which he had invented himself.

Mr. WICKSTUD, referring to multiple drilling, said no doubt different results would be found under different conditions, but he had found that where they could bring a couple of drills to bear upon the work side by side, and both under the immediate control of one attendant, they could do twice as much work in the same time as with a single spindle, and he might mention that even in a six spindle machine the work had been done in the same time as in a single-spindle machine. It was, of course, difficult to accomplish, but it was simply a mechanical difficulty.

Mr. HETHERINGTON said the arrangement of a series of drills was no novelty in the Manchester district, where it had long been adopted in connection with the manufacture of cotton machinery.

Mr. RICHARDSON (Oldham) said the subject of multitudinous drilling had been before the Society on several previous occasions, and in Lancashire they had had multiple drills in use for cotton machinery for a long time past. With regard to drilling boiler plates there was one thing he did not agree with, and that was drilling boiler plates before they were bent, which was a very barbarous method, as drilling a plate with a line of holes, and then putting it into a machine to be bent, could not fail to weaken the plate, the bending of it being, in fact, a partial breakage of the plate along the line of holes, and a great many accidents had occurred in consequence.

Mr. J. HEAD concurred in what Mr. Richardson had said with regard to bending boiler-plates after they had been drilled, and condemned a similar practice which was carried out in many ship yards with regard to ship plates.

Mr. PAGET also concurred. In the opinion that bending plates after they had been drilled was a cause of great weakness.

Mr. DANIEL ADAMSON said he had adopted drilling in the manufacture of boilers for a long time past. It was seven or eight years since he made up his mind that he would not make a punched boiler for anybody at any price, and he had faithfully adhered to that principle. For drilling this materials, such as were used in the manufacture of ordinary boilers, he had found two drills to be the most efficient, but he thought that the system of drilling inside was open to question as an economical operation. Mr. Richardson had alluded to the disadvantages of bending plates after the holes had been drilled, and he quite concurred in this. Whatever might be the system of making the holes, it was indispensable that the plates should not be drilled until after they were in position. He had adopted the system of drilling in position, and he was so satisfied with it that he would not change it. In conclusion, Mr. Adamson said he had not found the multiple drill to be advantageous in practical operation, and that drilling a large quantity of holes over the plates was not a saving of time, whilst he preferred the inside to the outside drill.

The discussion having been continued by one or two other members, Mr. HALL briefly replied; and on the motion of the PRESIDENT, who observed that they had learned a great deal with regard to drilling boiler plates, vote of thanks was passed to Mr. Hall for his paper.

A paper (the second of a series) by Captain Douglas Galton, C.B., "On the Effect of Breaks upon Railway Trains," was next read. He described minutely the results obtained by experiments on the London, Brighton, and South Coast Railway and the North-Eastern Railway. Recapitulating what appeared from these experiments to be the essential conditions of a good brake, he said the pressure with which the brake-blocks were applied to the wheels should be as high as possible, short of the point which would cause the wheels to be skidded and slide on the rails. The rotation of the wheel was arrested as soon as the friction between the brake-block and the wheel exceeded the adhesion between the wheel and the rail, and therefore, the amount of pressure which should be applied to the wheel was a function of the weight which the wheels brought upon the rail. The value of this function with the adhesion, hence with a high adhesion a greater pressure could be applied, and a greater measure of retardation obtained, than with a low one. In practice, and as a question of safety, it was of the greatest importance that in the case of a train travelling at a high rate of speed that speed should be reduced as rapidly as possible on the first application of the brakes. For instance, a brake which reduced the speed from 60 miles an hour to 20 miles an hour in (say) six seconds had a great advantage as regarded safety over a brake which would only reduce the speed from 60 to 40 miles an hour in the same time. The friction produced by the presence of the brake-block on the wheel was less as the speed of the train was greater; to produce the maximum retardation so far as speed was concerned the pressure should thus be greatest on first application, and should be diminished as the speed decreased, in order to prevent the whole from being skidded (or sliding on the rails) in making a stop. The co-efficient of friction decreased as the time increased during which the brakes were kept on; but this decrease was slower than the increase of the co-efficient due to the decrease of speed; it had, therefore, little influence in the case of quick stops. The maximum pressure should be applied to the wheels as rapidly as possible, and uniformly in all parts of the train. To prevent retardation from the dragging of the brake-blocks against the wheels when the brakes were not in use, care should be taken that the brake-blocks were kept well clear of the wheels (say, ¼ in.) when they are in a state of inaction. There are mechanical questions, however, connected with brakes, such as the desirability of having automatic action, and other considerations which do not enter into the scope of the present enquiry, the special object of which was to ascertain by direct experiment the forces brought into action in applying the brake-blocks to the wheels. Railway companies, in considering what form of brake was best suited for traffic, must, whilst they give full weight to the mechanical conditions discussed in this paper, also ascertain the durability and facilities for maintenance and repair presented by the various systems. It was further clear from the present series of

experiments that the universal application of continuous brakes would raise many questions as to the strength of the rolling stock now in use, much of which was constructed originally to meet other conditions of traffic.

At the close of the discussion a vote of thanks was passed to Captain Galton for his paper, and the PRESIDENT observed that one very important point had been brought out—that the retardation of a train was better effected when the wheels were broken just short of skidding than when they were actually skidded, which was just the opposite of the long-entertained notion.

The proceedings then terminated, a paper by Mr. H. A. Fletcher "On the Heslop Engine" being postponed to the next meeting.

**PREVENTION OF EXPLOSION IN COAL MINES.**—The Manchester Examiner says:—A simple instrument has been devised for ascertaining the presence of gas in coal mines. The invention is based on the marked difference between the glow of red-hot platinum in air free from or contaminated by marsh-gas. It is said that it will detect the gas when in the proportion of 1 in 60, and it should, therefore, be of some use in preventing colliery explosions.

**CALIFORNIAN AND EUROPEAN AGENCY.**—With a view to afford trustworthy information on subjects relating to California and the Pacific Coast, Mr. EDWARD J. JACKSON, of San Francisco, has established an agency under this title, which it is intended shall prove a safeguard in the future to those who have already invested in Californian enterprises, as well as to those who contemplate engaging in them. He gives as the cause of the numerous disasters that have befallen British investors in American enterprises that "under cover of a respectable directory at home, the members of which as a rule have known little or nothing about the undertaking, enterprises have been put on the London market at four or five times the amount paid for them in America, and the end has proved a miserable failure; hence confidence has been shaken in really meritorious enterprises. Schemes are quickly set on foot in America, and the proprietors carry them to Europe, and before the public of California are aware of it they are disposed of to parties who can not know anything about them except what they learn from those interested in getting rid of them." Mr. Jackson's object is to prevent misrepresentations of this kind, and thus secure to America the advantage of foreign capital, by protecting foreign capitals to an extent which shall give them confidence and some return for their outlay. He states that no country in the world presents a better field to capitalists than California and the neighbouring states and territories. The immense and undeveloped wealth of these countries must attract population and capital for a century to come. Nor is there another country which offers such facilities for the acquisition of wealth to those who invest their means judiciously; but in doing this the utmost caution is necessary. Business, especially that relating to land and mining matters, is conducted in a different way there to what it is in England, and it is absolutely necessary to understand this difference, and to know the character of the people with whom one has to deal, to bring it to a successful termination. Englishmen, as a rule, ignore these conditions entirely. Wise in their own conceits they go to that country, and setting aside good counsel and repeated warning, they rashly involve themselves in worthless enterprises, and fall into the pit which most probably had been carefully prepared for their reception. Mr. Jackson has had the advantage of a lengthened residence in California, has obtained a thorough knowledge of the people and the varied resources of the State, and for five years past has been the correspondent of the London Times, and a frequent contributor to the *Mining Journal*. Having visited most parts of the Pacific Coast he has an intimate acquaintance with the different mining and agricultural interests of that and the neighbouring States, and has had personal experience in the real estate business. He states that he stands alone, and wholly unconnected with others, as the representative of this agency, and assisted by two able and honest engineers and experts, with agents in different parts of the country, he is in a position at all times to acquire any information that may be demanded. It is to be borne in mind, too, that the purchaser of lands in the State of California has equal rights whether he be an alien or citizen, and that he can hold such land whether he live in Europe or California. The agency is favourably spoken of in California, and will, no doubt, be duly appreciated in this country.

**CHEMICALS, MINERALS, AND METALS.**—Messrs. J. Berger Spence and Co. (Oct. 19)—Alum: Loose lump, 4s. 7s. 6d. to 6s. 10s.; ground, 7s. 5s.—Arsenic: Best white powdered, 8s. 10s.;—Borax: Refined, English, 36s.—Copper: Green, 52s. 61s.; white, 8s. 7s. 6d.—Copper: Sulphate, 19s.—Nitrate of Lead, 12s. 15s.—Saltpetre: Refined, English, 27s. 27s.—Sulphate of Zinc, 12s. 12s. 6d.—Sulphur: Roll, 8s. 10s.; flowers, 10s. 10s.—The crystals, 6½ d. per lb.—White Lead, 20s. 25s.—Barites: Carbonate, 100s.—Brimstone: Best thirds, 5s. 10s.—Chinacite, 33s.—Oxide of Zinc, 22s. 10s.—Talc, 5s.—Umber, 70s.—Charcoal: Best stick, 4½ d. per bushel; field burnt, 6d.—Globe Steam Boiler Powder, 20s. per cwt.—Naphtha, 60 per cent., 8s. 6d.

A petition has been presented to the High Court of Justice for the winding up of the Petroleum Company of Italy.

#### ZINC ORES.

##### ARMAND FALLIZE, INGENIEUR-CIVIL, A LIEGE (BELGIUM).

BUYER

1.—CARBONATED AND OXYDED ZINC ORES (CALAMINE, &c.).  
2.—ZINC AND LEAD ORES MIXED TOGETHER, BUT DRESSABLE KINDS ONLY.

##### CAPPER PASS AND SON, BRISTOL

PURCHASERS OF

LEAD ASHES, LEAD SLAGS, SULPHATE OF LEAD, HARD LEAD, BRASS SLAGS AND ASHES, COPPER REGULUS, MATTE, SCORIA,

## Notices to Correspondents.

\*<sup>4</sup> Much inconvenience having arisen in consequence of several of the Numbers during the past year being out of print, we recommend that the Journal should be issued on receipt; it then forms an accumulating useful work of reference.

**TIN-PLATES.**—Would some reader kindly let me know the name of the works or company that manufacture a certain sort of tin plate, known to the trade by the mark of "Craig?"—J. N. P.: Russell-square, Oct. 24.

**TIN TRADE.**—Would any reader be kind enough to give in the Notices to Correspondents a positive number of tons of tin produced by Cornwall and Devonshire in 1876 and 1877? The Mineral Statistics of Mr. Robert Hunt give as returns obtained from the smelters, the round numbers of 8500 and 9500 tons; but it is very improbable that these numbers are equally exact as those of former years, which Mr. Hunt gives at p. 2 of each yearly volume. Perhaps they would also tell me by some few lines in what way the mines Wheal Eliza Consols and Wheal Prussia have diminished their capital, the former from 20/- to 18/-, the latter from 2/- to 5/- per share?—A.: The Hague, Oct. 21.

**DYNAMITE.**—Probably some of your readers can give us some information on the following subject:—We are offered some dynamite, containing 25 per cent nitro-glycerine, which is manufactured abroad. Has any English firm any patent rights whereby they could restrain us from importing this dynamite?—A. and W.: Newcastle-on-Tyne, Oct. 22.

**THE LAXEY WATER WHEEL.**—The largest but one in the world: It pumps over 200 gallons of water per minute; the circumference of the wheel is 217 ft. 6 in.; the diameter, 72 ft. 6 in.; the breadth, 6 ft.

**WHAT IS ELVAN?**—Would some correspondent kindly inform me, through the medium of the Journal, what is Elvan, what is its character as a rock, and how I may be able to know it? Is it a porphyry? I hardly think it can be what miners call a whin stone, but it may be what I have heard Cumberland miners describe as trap, but which I believe is elvan. He does not know elvan (at least by that name), and I should be greatly obliged if some correspondent could assist me to know elvan.—SUBSCRIBER: Douglas, Isle of Man, Oct. 22.

**Received.**—"J. H." (Bridgend): The letter has been forwarded as requested.—"T. W. B."—"A. S." (Tasmania)—"E. J. J." (San Francisco)—"K. S. P." (New York)—"Shareholder" (Wheal Uny)—"Constant Reader" (Greenock)—"S." (Phoenix Mine)—"Shareholder" (Wheal Grenville)—"M. S." It will be handed over whenever called for—"Old Subscriber" (Manchester) should write to the directors, through the secretary—"B." An article on the subject appears in this week's Journal—"Enquirer" (Dublin): We will endeavour to ascertain the particulars, for publication next week.

## THE MINING JOURNAL, Railway and Commercial Gazette.

LONDON, OCTOBER 26, 1878.

### THE MINES REGULATION ACT, AND COLLIERIES MANAGERS.

The prosecutions recently undertaken at the instance of the Government against the certificated managers of certain collieries where explosions, involving a very heavy loss of life, have taken place have turned out in every instance unsuccessful, so the results have led the miners and their leaders to the opinion that the Mines Regulation Act of 1872 is in every way inept so far as getting within its meshes the persons who are generally considered responsible for the safe and efficient working of mines, whilst it easily catches the smaller fry in the shape of the working pitmen pure and simple. It is evidently this opinion which led Mr. CRAWFORD about a fortnight ago to issue a circular convening a special conference of the mining body throughout the kingdom, with a view, as he says, of "seeking from the Legislature some increased safety for working miners." There is evidently, too, some ground for the statement he makes that during the last 12 months some four or five explosions have taken place, involving a loss of no less than 660 lives, and for which "no one has been or can be held in the slightest degree responsible." The failure of the charge preferred against the underground manager of the Haydock Colliery, although, in all probability, inevitable in strict law, has been anything but assuring to the pit workers, showing, as they say it does, that responsibility cannot be brought home to a certificated manager of a colliery even where 190 persons were killed. From this it is argued that the law applicable to colliery managers has failed in showing that they are actually responsible for the proper ventilation of the mines in their charge, and this feeling cannot fail to be greatly intensified by the announced failure of the charges preferred against a well-known viewer—Mr. JAMES HENRY PRICE—late certificated manager of the Burley Mine of the Apedale Collieries, near Stoke-upon-Trent, where on March 27 last there was an explosion of fire-damp, causing the death of 23 persons. Proceedings were ordered to be taken against Mr. PRICE by the Home Secretary, and the charge was heard before Mr. SPOONER, county court judge, and Mr. EVANS, Government Inspector of Mines for Derbyshire, at Stoke-upon-Trent on Saturday last. The Treasury was represented by Mr. BOOTH, and the defendant had the services of Mr. UNDERHILL, barrister, so that the hearing was expected to be an interesting one, and it was thought the evidence would have been found sufficient to substantiate the charge, which was laid under the 32nd section of the Mines Regulation Act of 1872. That section enacts that if any manager holding a certificate is by reason of "incompetency or gross negligence" unfit to discharge his duties, or has been convicted of an offence against this Act, the Secretary of State may, if he thinks fit, cause enquiry to be made into the conduct of such manager." By subsection 6 of the clause it is also provided that the Court shall have power to "cancel or suspend the certificate of the manager" if they find he is by reason of incapacity or gross negligence unfit to discharge his duty. The charges against Mr. PRICE were that he had not provided sufficient ventilation in the pit so as to make the working of it safe, that he permitted the return air used for the ventilation of the mine to pass over a dumb-drift and over the ventilating furnace, so that by the return air being impregnated with gas there was always the danger of an explosion; and that he caused a thriling or passage to be cut into the furnace-dip, by which the course of the air to the furnace was much shortened, &c., so that by so acting he had caused the loss of 23 lives. The issues to be tried were, consequently, simple to all appearance, and that such was the opinion of the legal advisers of the Treasury we may feel certain for it is not assuming too much to say that those who drew up the clauses of the Act of Parliament, or had a hand in so doing, should be able to interpret them in their true legal sense and meaning, or at least what the Legislature intended them to be. But the most important clauses seem capable of being construed by magistrates very differently to what they are by the Home Secretary and the solicitors to the Treasury. Hence it is that the few cases which have been tried under the 32nd clause have all broken down. There is, therefore, some ground for the complaints made by those acting on behalf of the miners that where an explosion has taken place, owing to the ventilation being insufficient to neutralise and render harmless the gases, no conviction has followed where charges have been preferred at the instance of the Government, and that further legislation is necessary.

We do not say that any of the persons who were charged with an offence or offences under the Mines Act were morally or legally guilty, but we do not think they should have been called upon to answer any complaint under any section unless there was the strongest probability of conviction being obtained. In the case of Mr. PRICE, the Government Inspector of the district, Mr. WYNNE, in giving evidence, said he believed the gas in the return air as it passed over the furnace at the bottom of the dip came into the flames and ignited, and that the danger was increased by a thriling or passage cut into the furnace dip the day before the explosion, which added to the danger of an explosion by shortening the course of the return air and diminishing the chance of its mixing with the gas so as to render the compound harmless. He also stated that he believed the proprietors had done their utmost to secure adequate and proper ventilation. But from the statement of Mr. WYNNE just given the mine appears to have been a dangerous one, for all colliery managers know that in a mine where gas is given off scarcely anything is more calculated to lead to an explosion than to allow the returns to pass directly over a furnace, by which ignition is rendered very easy, and so invites what should be avoided. No doubt the proprietors and managers did all they could to prevent

an accident, but they must have known that danger was always to be apprehended owing to the mode of ventilation. This was fully borne out, not only by the result, but from a statement of Mr. WYNNE himself, who said he should have compelled the manager to put a stop to the furnace had he not been aware that a fan was in course of preparation and about to be erected. Here we have another illustration of the dangers attending delay. Still, with the knowledge of the Government Inspector, as stated above, although so much was to be feared from the furnace that it was only to be tolerated for a short time, the men were allowed to go to work as usual, and the gas allowed to go close to the fire. But we are decidedly of opinion that with the admitted danger it would have been only a matter of duty to have discontinued working until the fan was put down. Had this been done there would have been no explosion, and the lives of many men would have been spared. It may be said that it is very well to be wise after the occurrence, but then in a mine men should on no account be exposed to a known danger, which may at any moment render them lifeless. But it is too frequently the case that immunity from accidents when surrounded by dangerous elements leads to carelessness or even recklessness, until at last the spark is lighted, sending scores to an untimely death, but which might have been averted by prudence and known precautionary measures. In the accident at Apedale it is evident that the ventilation was deficient, and that the first general rule had not been carried out, for it provides that an adequate amount of ventilation shall be constantly produced in every mine to dilute and render noxious gases harmless, so that the various places shall be in a fit state for working and passing in; but instead of this rule being complied with the air and the gas together formed an explosive compound, and actually passed over the flames of the furnace, and as a matter of course led to an explosion. But no person is to blame, for the Judge and the Assessor said that there was not a tittle of evidence to show that the explosion had been caused by either the gross negligence or incompetency of Mr. PRICE, so that the charge was dismissed, and the costs of the defendant given against the Treasury. This will prove a strong argument on the part of Mr. CRAWFORD and the Manchester Miners Conference that will be taken full advantage of, and it will also commend itself to those members of the House of Commons who have taken an interest in mining questions. The giving of costs against the Treasury must be anything but pleasing to Mr. CROSS, when taken in connection with the loss of the suit promoted by himself, and it is, therefore, not unlikely that he will be more willing than he would otherwise have been in making some material alteration in or addition to the Mines Bill of 1872. For ourselves, we have long been of opinion that legislation in connection with coal mining has gone far enough, but seeing that all charges brought against persons for being in some way the primary or secondary causes of explosions in mines where the loss of life has been of an appalling character have failed, and that no one, according to the magisterial decisions, can be held responsible for them, even when the result of defective ventilation, some alteration would appear to be called for, seeing that the workmen have taken the matter up so warmly. It is, therefore, not unlikely that next session will see the Home Secretary taking some action with regard to the subject on the application of the working miners, the arguments in whose behalf, owing to the miscarriage of the several cases ordered to be prosecuted by the Home Secretary, will be more powerful than ever they have been before.

### ENGLISH COAL AND IRON IN FRANCE AND BELGIUM.

It is somewhat singular to find just now that the French colliery owners are trying all they can to prevent any increase in the importation of English coal, whilst our ironmakers are endeavouring to obtain from the Belgian Government a remission of the import duty on British pig. For some time past an able correspondent of the Journal has advocated the sending of coal from some of our ports direct to Paris, and has pointed out how easily that could be effected by improving the navigation of the Seine, and making it navigable from the sea to Paris. That this would be of the greatest advantage to the inhabitants of the gayest capital in Europe admits of no question, for it would not only give them coal at a much lower price than it has yet been, but it would also give them many other products at a corresponding low rate. This has been so apparent that the French Minister of Public Works a short time since announced his intention to improve the navigation of the Seine for increasing the depth to a minimum of 10 ft. 8 in., and making the currents there even. Were this effected English vessels of fair tonnage would be able to go up to Paris and discharge their cargoes there, and as it is admitted that coal can be carried at a much lower rate by water than by railway we should be in position to undersell, or at least successfully compete with, both French and Belgian colliery owners. With such a prospect staring them in the face the French mine proprietors have become somewhat alarmed, and several of them have pointed out to the Minister how advantageous it would be to have a deep canal from the northern coal fields and those on the Belgian frontier to a point near Paris. France, it may be said, has a coal field 1000 square miles in extent, with an average thickness of 60 ft., yet it only yields about the same quantity as Yorkshire, thus showing that there is a great lack of enterprise, and that coal mining is anything but a popular pursuit in France. For years past from 5,000,000 to 6,000,000 tons of coal have had to be imported to meet the requirements of consumers, and only last year we sent to the various French ports 2,982,372 tons, so that there is not the slightest ground for the policy now being brought to bear on the Minister of Public Works to prevent him from improving the Seine in the interest of English and other colliery owners, as well as other maritime countries that export goods to France. A special committee has been appointed by M. DE FREYCINCT to consider the claims urged on behalf of the French mining interest, but the members are also to consider how far the despatching of the Seine would affect the trade in consequence of English competition, and to study the necessity and cost of the proposed canal, so as to maintain the supremacy of French coal in the Parisian market. The question is really one of cheap or dear coal; but, as we have before stated, France finds no difficulty in selling all she produces, so that she has nothing to fear from English competition. The inland markets in particular are at the command of the French colliery owners, and English coal would compete more with the Belgian and German than with that of any part of France, and there is certainly no reason why the inhabitants of Paris should be taxed in the vain endeavour to establish a monopoly in favour of home production. French iron and steel has also to compete with that of other countries, so that for their production fuel at a moderate price is an essential. At present the make of pig in France is about 1,500,000 tons a-year, and of wrought-iron 800,000 metric tons, and of steel barely 300,000 tons, so that there is a large consumption of coal in connection with those industries. On the other hand, the English coal imported would be principally for household and gas-making purposes, and for these is superior to either the local, Belgian, or German coals. It is, therefore, to be hoped that facilities will be afforded for the English coal reaching Paris direct by water, as it would be for the benefit of consumers and shippers alike.

It has often been remarked that whilst foreign goods are admitted free of duty into England, the same privileges are not granted to us by many of those countries. We are in this position with respect to Belgium, from which 50,000 tons per annum of the special products of that country's mills and forges are imported free of duty. These goods compete with our own, and, owing to low wages and the long hours worked, the makers of them are able to undersell us in our own markets. This is by no means pleasant, but we accept it as an accomplished fact, and think no more about it. But in the present state of the iron trade we look for a little reciprocity, by which neither the revenue of a foreign state nor the ironmakers in it, would in any way be injured. Now, we know that Belgium cannot produce pig-iron by any means as cheap as England, whether everything is more favourable for the making of it, so that to the former we export a considerable quantity every year. But when it reaches that country there is an import duty charged of 2*d.* per cwt. As this has been a serious drawback to

the trade, the board of management of the British Iron Trade Association have petitioned the Belgian Ministers of Finance to remit the duty now levied on British pig, and this do on several grounds that we believe will meet with favourable consideration, as they deserve to do. It is stated that the duty is not really protective to Belgian pig-iron makers, because they cannot produce pig under as favourable conditions as England and Luxembourg, for, although apparently considerable in amount, it is reduced by the drawbacks allowed, and what is left must be almost wholly absorbed in the cost of collection. That not only are the English producers and Belgian consumers of pig alike anxious for the abolition of this duty, but the most important maritime association throughout the kingdom of Belgium as well, and especially that of Antwerp. Another important argument in favour of the abolition of the duty is that it would be certain to develop a larger trade between Belgium and England, and by enabling Belgian iron-founders, forge-masters, and engineers to purchase their crude iron more advantageously, it would enable them to distribute their products over a wider area, and would, moreover, benefit Belgium by affording employment to a large number of hands in the Belgian mills and forges occupied in converting the crude iron into manufactured products. There are also some other grounds adduced in favour of a remission of the duty, which will, no doubt, meet with that consideration from the Belgian Government that their importance entitles them to, and it is to be hoped in the interest of both countries, that the prayer of the petition of our ironmasters will be acceded to.

### PARIS UNIVERSAL EXHIBITION, 1878.

The first proof (to be revised from the General Official List of Awards of the International Jury) of the List of Awards made to British Exhibitors has just been issued by order of H.R.H. the Prince of Wales, as President of the Royal Commission for Great Britain and Ireland, and British exhibitors may fairly be congratulated upon the number of honours they have secured for this country. It is explained that at a meeting of the Superior Commission and of the Jury of Presidents held on July 27, and presided over by M. Teisserenc de Bort, it was determined to double the number of gold medals, and to increase in a less proportion the other medals and awards, one of the reasons being the unexpected number of exhibitors, stated as amounting in round numbers to 53,000. The amended list provided for 130 grand prizes, 2470 gold medals, 6490 silver medals, 10,000 bronze medals, and 10,000 honourable mentions—29,500 in all. The present number of recompenses is in excess of this figure, there being 2510 gold medals, 266 rappels of gold medals, and 363 diplomas equivalent to gold medals, making a total of 3139 for gold medals alone, but duplicate medals, &c., have to be deducted.

Of the nine groups into which the exhibits of the various nations were distributed, the fifth—Mining Industries—and the sixth—Machinery—are those in which the readers of the *Mining Journal* are chiefly interested, and, turning to the lists of awards in these groups, it will be found that in class 43—mining and metallurgy—the Grand Prix has been awarded to Sir John Brown and Co., of the Atlas Steel and Iron Works, Sheffield, for armour-plates; to Cammell and Co., of the Cyclops Works, Sheffield, for armour-plates; to Johnson, Matthey, and Co., of Hatton Garden, London, for platinum; and to Sir Joseph Whitworth and Co., of Manchester, for fluid-pressure steel; whilst Gold Medals have been awarded to Messrs. Baldwin, of the Wilden Works, Stourbridge, for sheet-iron and tin-plates; to Brown, Bayley, and Dixon, of Sheffield, for steel rails and tyres; to the Broughton Copper Company, of Manchester, for copper; to Bury and Co., of Sheffield (rappel), for steel and tools; to Elkington and Co., of Birmingham, for electro-plate; to Earl Granville and the Shelton Iron Company, of Stoke-upon-Trent, for Staffordshire iron; to the Hadfield Steel Foundry Company, of Athercote, Sheffield, for cast-steel; to Harrison, Ainslie, and Co., of Ulverston, for charcoal pig-iron; to W. Jessop and Sons, of Sheffield, for cast-steel; to the Landore-Siemens Company, Westminster, for steel; to the Leeds Forge Company, for Yo-kshire plates; to the Lilleshall and Sandhill Company, for Staffordshire iron; to the Plumbago Crucible Company, Battersea, for crucibles; to G. H. Ramsay, of Newcastle-on-Tyne, for coke, coal, and fire-clay; to Seebohm and Diebstahl, of Sheffield, for steel; to George J. Snelus (collaborateur), of Working-ton; to Thomas Turton and Sons, of Sheffield (rappel), for steel and tools; to the West Cumberland Iron and Steel Company, of Workington, for steel-plates; and to the Wigan Coal and Iron Company, Lancashire, for coal.

In the other class—Class 50—to which reference may be made, and which embraces apparatus and processes of the art of mining and metallurgy, not one Grand Prix was awarded, and only one gold medal—that to the late Mr. T. Whitwell for his hot-blown ovens. Silver medals were awarded to the Diamond Rock Boring Company, of Westminster, for a rock-drill; to Hathorn and Co., of Charing Cross, for a rock-drill—no doubt Elliott's new Eclipse drill, recently referred to in the *Mining Journal*; and to Tangye Brothers, of Birmingham, for pumps. Bronze medals were awarded to Le Gros, Mayne, Leaver, and Co., for rock-drill; to J. Cliff and Sons, of Doulton and Co., and to the Plumbago Crucible Company for crucibles; to Robey and Co., of Lincoln, for mining engine; and to Savile Street Foundry Company, of Sheffield, for ventilators; and to Mather and Platt, of Manchester, for stone-breakers. Honourable mention was awarded to R. Broadbent and Son and H. R. Marsden for stone-breakers; to Le Grand and Sutcliffe and to Salmon, Barre, and Co. for rock-drills; to Brunton and Co. for safety-fuses; and to J. Cooke and Co. for safety-lamp. First on the list of Silver Medalists in Class 68 stands the Abernant Ironworks and Collieries Company, of New Bridge-street, London, for a display of bricks, which were certainly very attractive. In this class Messrs. Collison and Lock, of Fleet-street, received a gold medal for their fine Old English house in the Avenue of Nations; Hobbs, Hart, and Co., of Cheapside, were awarded the same for their safes; and Messrs. Doulton received a Grand Prix for their earthenware pipes. In Class 51—machines and apparatus in general—Messrs. Galloway and Sons, of Manchester, have been awarded a Grand Prix, but it has not yet been decided what for, and gold medals were awarded to Messrs. Clayton and Shuttleworth, of Lincoln, reason of award not stated, and in Class 51 a similar honour for thrashing machines; to Hathorn, Davis, and Davey, of the Sun Foundry, Leeds, for hydro-draulic apparatus; to Robey and Co., of Lincoln, for steam-engine; to Tangye Brothers, of Birmingham, for steam-engines. In Class 55—Machine Tools—J. Hall, of Chancery-lane, was awarded a silver medal for a boring-machine; and in Class 58 Johnson, Matthey, and Co. were awarded a Grand Prix for refining machinery.

The irregularity of the awards at all exhibitions has almost invariably been a matter of complaint, and, without any desire to find fault with the exertions of the jurors, the lists cannot be looked at without leading to the conclusion that in different classes widely different views have existed, and consequently many curious awards made. It can scarcely be doubted that had the exhibits in Class 50 been recompensed by the jurors of Class 43 the exhibitors would have been much better rewarded, unless, indeed, the different awards are open to explanation. Few men are likely to be better able to judge of the value of a crucible than John Arthur Phillips, who was, perhaps, the most prominent member of the jury of Class 50, and the jurors of this class saw nothing in crucibles worth more than a bronze medal, which honour was awarded, amongst others, to the Plumbago Crucible Company, of Battersea. Now, assuming this to be a sound award, how comes it that the same exhibitors, and presumably for the same article, receive a gold medal from the jurors of Class 43. Again, Appleby Brothers get a bronze medal for their lift in Class 50, and a silver (rappel) in Class 51; also H. R. Marsden, who merely gets honourable mention in Class 50, is awarded a gold medal in Class 58. These discrepancies, if they be such, might be referred to almost indefinitely, but these instances will suffice, and although they are a great measure due to the absurdity of admitting the same exhibits in two or more classes, so that some exhibitors take the chance of getting a higher honour where the jurors are less acquainted with the precise merit of the exhibit, they may be as real as the rest.

**COPPER.**—The exports of Exported  
" "  
**PLACERVILLE** is last notice  
isings un-  
ding the  
quartz is  
est part of  
yield of the  
extensive v  
it is down  
can be ra  
etting wi  
e realis  
ng the l

cepted by the less fortunate as a consolation from the conclusive evidence afforded that in such awards no fixed standard has been chosen, and that the obtaining of high honours depends as much upon good fortune as absolute merit.

#### COAL MINING AT THE ANTIPODES.

While ever so many coal mining companies projected during the last few years in Wales and other parts of Great Britain have resulted in dismal failure, the Scottish Australian Mining Company (Limited) is enabled to declare a dividend for the half-year ending June 30, 1878, at the excellent rate of 15 per cent. per annum. The company's mainstay is the Lambton Colliery in New South Wales, and the net profit realised from this colliery during the period in question was £18,081, the necessary disbursements for maintenance and renewal having, of course, been provided for. The general coal trade of New South Wales has continued to show a steady progress this year, and the Scottish Australian Mining Company (Limited) has fully participated in the increased amount of business which has been done. The company's colliery viewer, Mr. CROUDACE, has, after a service of 17 years, recently paid a short visit to this country, and has thus afforded the directors an opportunity of conferring with him upon many matters. Mr. CROUDACE leaves London shortly on his return to New South Wales, and he takes out with him much valuable information acquired during his stay in Europe, which will probably be of use to him in the future prosecution of his duties at the colliery.

Including a balance of £2254/- brought forward by the Scottish Australian Mining Company (Limited) from the previous account, the balance available for dividend is £18,468/. The proposed dividend at the rate of 15 per cent. per annum will absorb £12,000/- of this sum; and it is proposed to add £3500/- to the reserve fund, thereby increasing it to £21,000/. After all this is done, the company will be enabled to carry £2968/- to the credit of the next account. The company's colliery appears to be managed with economy and prudence. Thus while 99,403 tons of coal sold for £56,789/-, and 44/- was derived from rents of cottages and miscellaneous sources, the working expenses incurred to secure these results were confined to the following items:—Colliery general charges, carriage and crageage of coal, and shipping charges, 34,851/-; maintenance, renewal, &c., of railway rolling stock, plant, &c., 3521/-; and proportion of Sydney general management expenses, 400/. The balance of £18,081/- is the amount previously indicated as profit of the half-year. The charges in London are also distinguished by the same economy being limited for the six months ending June 30, 1878, to £1159/-, this sum including 500/- forming the half-yearly remuneration of the directors.

It will excite some surprise when we state that although the company's Lambton Colliery is yielding a profit of something over £30,000/- per annum, it only involved a cost to the company of £1,874/-, this sum including a railway, rolling stock, buildings, horse stock, pits, mining plant, stores, implements, land, &c. Had the Scottish Australian Mining Company (Limited) confined its operations to the Lambton Colliery it would have been a still more lucrative concern than it now is, as a capital of £100,000/- would have been sufficient for its business, and a dividend at the rate of 30 per cent. could have been paid upon that amount. The capital actually raised by the company is, however, £160,000/-, and although the Lambton Colliery is a source of great wealth and profit there are other departments of the undertaking which have been attended with less favourable results. Thus the company was not content to confine itself to the extraction of coal, but it has also embarked in copper mining. The amount of capital which has been sunk in two copper properties would appear to have been £47,440/-, and at present the dividend results obtained have been just about *nil*.

#### THE IRON AND STEEL WORKS OF AMERICA.

The numerous contributions to the statistical literature of the Iron and Steel Trades of the United States by the energetic secretary of the American Iron and Steel Association—Mr. JAMES M. SWANK—have been from time to time referred to, and he has now made a valuable addition by the issue of the revised Trade Directory, which has been carefully corrected to Sept. 1 of the present year. The Directory now published contains many features which are entirely new, although its leading features do not vary from those of its predecessors. A better classification of the steel-works of the country and of the works that manipulate steel has been adopted; and in the description of furnaces there has been incorporated, as far as practicable, the quality and brands of iron made by each furnace, and the kind of ore used. In the description of rolling-mills an effort has been made to obtain information concerning the specialties of each mill and the brands used; and in the description of steel-works a fairly successful effort has been made to ascertain the number of pots in each establishment.

The results of the enquiries has been very ably summarised, and it appears that on the date mentioned—Sept. 1, 1878—there were 698 completed blast-furnaces, of the annual capacity of about 5,228,000 English imperial or metric tons. Of this quantity the bimetallic furnaces represent 2,302,430 tons, the anthracite furnaces 2,031,090 tons, and the charcoal furnaces 890,000 tons. There were 340 rolling-mills, with 4463 single puddling-furnaces. In steel-works and bloomeries there were also 51 single puddling-furnaces. There were 1347 trains of rolls, of which 1252 were in rolling-mills, and 95 in steel-works of all kinds. The annual capacity of all rolling-mills in finished iron was 3,970,000 metric tons, out of which the rail-mills in heavy rails represented about 1,755,000 tons. There were 11 Bessemer steel-works, having between them 22 converters, their capacity for ingots being about 667,500 tons. There were 14 open hearth steel-works, with 22 furnaces, the aggregate capacity of which was about 89,000 tons. There were 33 crucible cast-steel works, with about 3400 melting-pots, the productive capacity of which was about 80,000 tons. There were 8 miscellaneous steel-works, of the estimated capacity of 19,600 tons of merchantable steel. The 64 Catalan forges producing blooms from ore were of the annual capacity of 57,850 tons, and the 58 bloomeries producing blooms from pig-iron were also of the capacity of about 77,850 tons.

It must be understood that the producing capacity of the iron and steel works here given are the aggregates of individual returns of individual establishments; but some of them can never be realised in practice. Blast-furnaces and rolling-mills cannot be uniformly operated to their full capacity, nor can all of them be in operation at the same time; but the working capacity for the steel-works, forges, and bloomeries is probably not overstated. The plane affords an enormous quantity of information, and is well worthy of attentive study.

**COPPER.**—The following figures will be interesting in respect to the exports of unwrought copper:—

	Tons.	Value.	Average per ton.
Exported during Sept., 1876 ...	903 ...	£71,079 ...	£78 14 0
" " 1877 ...	862 ...	63,550 ...	73 14 0
" " 1878 ...	1025 ...	69,585 ...	67 17 0

**PLACERVILLE GOLD QUARTZ COMPANY.**—When this company last noticed operations had been just commenced, and the old workings unwatered. The latest advices are to the effect that the sinking of the shaft had been resumed, while the levels were being cleared and rich ore laid open. The fact that a substantial test medal from the Arthur Phillip jury of Class 54, so highly mentioned in Class 54, shows what results may be expected when the mine is laid open. These discussions are almost indefinitely continued, though they are not the same as those taking place in the same district. The same exhibitors take the same attitude, and they may be less interested in the matter.

experience in gold quartz mining, he is of opinion that the test made, as mentioned above, has given the mine a fair and complete trial, and has in all respects thoroughly satisfied him that the mine is valuable, and the future prospects of the company all that can be desired. This company is being watched with much interest. The resuscitation of the mine has already given an impetus to the quartz mining in the immediate neighbourhood, and bids fair to be of lasting value to the district.

#### REPORT FROM CORNWALL.

**Oct. 25.**—Further evidence, if any had been needed, of the truth of our remarks respecting the uncertainty of the condition of mining affairs just now was again supplied last week. On the previous Friday the tin standards had been dropped just when it was hoped and believed that the danger of a fall was over. Last Friday, when very few, if any, could have expected a rise, up the standards went again. What may have led the smelters to act in this uncertain way must be best known to themselves. It certainly is not very apparent outside the charmed circle. Granted that trade was dead, and that an already dull business had been made much duller by the failure of the Glasgow Bank. This last at least was a temporary cause merely, and certainly not sufficient in itself to justify such a very serious step in the reduction of the standards to a point lower than any to which in living memory they have ever fallen. But if the stoppage of the bank, either alone, or in conjunction with any other causes, was held to authorise the laying on of the "last straw" in this sudden fashion, what reason can be assigned for putting the standards up again? We are certainly not at all inclined to quarrel with this step on the part of the smelters. They would have to put the standards up a good many pounds before we should be disposed to ask them to hold their hands; but for all that, we would like to know what are the motives which actuate these proceedings. If they were right in dropping the standards, there was very little reason why they should put them up again while the general condition remained almost unaltered. If they were right in the rise, then they seem to us to have blundered sadly in the fall.

Dr. Foster has made a raid upon the clay merchants of the Newton Abbot district. In the clayworks of the parish of Kingsteignton in that neighbourhood the clay is raised by shaft mining, and Dr. Foster not only found that sundry of these pits were improperly fenced, but that they were very badly ventilated. The ventilation was not worthy of the name, although there was certainly an appearance of ventilating provision, and an attempt was made to throw the blame upon the workmen, while one of the advocates for the defence hit upon the ingenious theory that "looking at a candle" made it go out. Dr. Foster said that in one of the levels of a pit belonging to Messrs. Whiteway and Mortimer this air was so foul that his candle went out three times whilst in an upright position. The candles which the men were using underground were placed halfway between the top and bottom of the level in a horizontal position. He made experiments with a candle in different parts of the level with the same result. There was a ventilating pipe running down the shaft, but it extended only to within about 10 ft. of the bottom of the shaft, and was above the level. The only arrangement for forcing air into the shaft at that time was a windsail. The ventilating pipe was 6 in. square. There was a fan-wheel on the ground at the top of the shaft, but it was not in use. Fountain's pit, belonging to Messrs. Waits, Bearne, Blake, and Co., was visited by Dr. Foster just as the men were leaving work, upon which the men on the surface began blowing with the fan-wheel at the top. The ventilating pipe went only into the shaft not into the levels. In one of the levels, about 9 yards from the shaft, a lighted candle held perpendicularly about 4 ft. from the bottom of the level went out in about four minutes. In this case the ventilating pipe was only a small gas-pipe and notice had been given to have the ventilation attended to. The Bench inflicted a penalty of 17. and costs in each case. This shows the need of these smaller works being well looked after.

#### REPORT FROM NORTH WALES, SALOP, AND CARDIGAN.

**Oct. 24.**—Among the useful public works in progress at the present time in North Wales may be mentioned the bridge over the River Mawddach, at Penmaenpool. This bridge will give easy access to the large population north of the river, including those connected with the gold mines, to the Cambrian Railway. Heretofore the access could only be had by going either to Barmouth on the west, or Dolgellau on the east. The works on the Bala and Festiniog Railways have actually been commenced, and a bridge over the River Dee, near Bala, is in the course of construction. The heading of the tunnel near to Festiniog, on the Bettws y-Coed and Festiniog line, is through, and the line approaching completion. The tunnel passes through the slate rocks, but some of the series are found to be absent. The little creek and port of Pensarn on the Cambrian coast line, between Barmouth and Portmadoc, is attracting attention. It is well adapted for a good shipping trade, and a siding runs down to the quay. Some of the paving sett quarry companies near Portmadoc are contemplating shipping their stone from this port, the difficulty and expense of reaching the quay at Portmadoc being so great, involving, as it does, transhipment to a narrow gauge line, and the payment of freight to two or three railway companies. I would suggest to the Cambrian Railway Company, and to the authorities of Portmadoc, the extreme desirability of the construction of an ordinary gauge siding down to the port. The network of narrow gauge lines may be avoided if the line is taken down the north side of the river to the deep water above the bridge near the station of the Festiniog line. This bridge should be altered into a movable one, so that ships could pass to the upper or eastern side of it.

I am informed that the surveys of a narrow gauge railway from Oswestry to the mineral region of Llangynog are approaching completion. The line will turn from the Cambrian Railway a little below the town of Oswestry, pass up the Morda valley to the Lawnt, where there are limestone quarries, then down another valley to Llanllisilin, from thence by Penybont, Llangadwin, and Llanfairhaearn to Llangynog. This is the natural route. The line will open out a rich district, and if it is economically made will prove a commercial success. The engineers are local men, Mr. W. H. Spaul, of Oswestry, and Mr. George Owen, engineer of the Cambrian lines, of the same town. The leading landowners are, as they ought to be, favourable to the scheme, and everyone interested in the district should desire its successful completion.

Among the districts where similar cheap railway communication is much needed I would mention the Rhedol and Ystwith valley from Aberystwyth up to the lead mining region of Goginan. A good deal of money is derived from this district yearly, and a good deal is lost for want of better means of communication. Is there no one public spirited enough to inaugurate a movement towards supplying the want?

The railway from Bangor to Bethesda is not to be made after all. The negotiations with the London and North-Western Railway Company have been broken off. Nantlle, Bettws Garmon, Festiniog, and Corris can have their lines, but Bethesda cannot have its line. Why? Well, the only answer I am at liberty to give is—"Twenty thousand quarrymen should ask the reason why?"

A new industry is springing up in the quiet out-of-the-way town of Cardigan. Messrs. Woodward and Co. are producing artistic pottery, samples of which have received very high praise. We are told that their productions "are not to be surpassed by anything outside Greek collections." The clay used in this district must be a surface clay, and it is not often that the recent clays are found pure enough for such purposes. With works of art rivalling ancient Greece, and the approaching railway, Cardigan is waking out of its long sleep.

An uncertain mine is often as good as a large landed estate to its owner. The Great West Van, which is, indeed, a great way west of the Van—some six or seven miles—was sold last week to the original vendor for £2050. Only a few years since the vendor sold it to the late company for £26,000/-, and he now gets the property back with shafts sunk, levels driven, and machinery added for one-twelfth

of the sum. The case illustrates a segment of the usual cycle run by many mining enterprises. Soon a new and valuable discovery will probably be made, the property will receive a new name, its riches will be vividly described, and when times brighten it will again be sold for £20,000/- or £25,000/-, and so will be added another segment to the cycle.

Messrs. Sparrow and Son, of the Ffrwd Ironworks, have intimated that if the workmen will not submit to a 5 per cent. reduction the works must be closed. Nearly all the small collieries of South Shropshire are closed, or used only for the mining of ironstone.

#### REPORT FROM NORTH AND SOUTH STAFFORDSHIRE.

**Oct. 24.**—Depression has still to be reported as the feature of trade in South Staffordshire. Upon hardly any hand is business improving; on the contrary, matters in the pig-iron market appear to be getting worse. The approach of winter finds us with only just enough work to do to keep afloat, and much of this is resulting in absolute loss. Competition is severe in the iron and in the coal trades, for the limited number of orders on the market is the subject of much underselling by traders in the district and by firms from a distance. That trade will revive in the spring all earnestly hope, and not a few expect, but even the most hopeful have little or no ground upon which to base their expectations. The only new characteristic this week is that the ironworkers commenced on Monday to work at the drop of 5 per cent. in their wages awarded by Mr. Joseph Chamberlain, M.P.

The proposed alteration of the length of the working day at the pits continues to be the subject of much public discussion amongst the men, and in every instance the meetings, whether mass or delegate, have resolved to reject any plan by which the hours of labour are sought to be increased. At a conference at Dudley on Tuesday of masters and men it was resolved that if the colliers would consent to work another hour per day the wages of the thick coal men should be increased 6d. per day and those of the thin coal men 3d. per day. Meetings of the men that have been held to consider this proposal have resulted in similar resolutions to those just indicated. The injurious eight-hours system will, it is evident, be clung to with very great tenacity.

The report of the Aldridge Colliery Company (Limited), which has just been issued, states that the progress of the undertaking has been seriously hindered, and a loss incurred of £1266/- by the accident to the machinery in July last year. The length of gate road that has been driven during the year is 1600 yards. The coal has been proved up to the boundary of the estate, and "both in quantity and quality the result is very satisfactory." The company's income has been £1408/- Placing against this amount the management expenses, interest on borrowed money, and loss on brickyard trading, the year's operations show a deficiency of 79. 12s. This reduces the balance carried forward to 768/-.

The Spot Lane Colliery Company, West Bromwich, must be highly gratified at the award of the umpire (Mr. William Bryham, Rosebridge Colliery, Wigan), just to hand, in the matter of their dispute with the Home Office. Originally Mr. J. P. Baker, the Government Inspector of Mines for the district, reported a rapid and dangerous increase in the column of water standing against the company's colliery, but on legal proceedings being taken he was unsuccessful in establishing his case. After the lapse of a year he again gave the company notice of a dangerous rise in the water, and arbitration was resorted to. The umpire's award is now entirely in the company's favour, and the costs will fall upon the Treasury. Mr. Walker, Wolverhampton, was the solicitor representing Mr. Baker, and Mr. Jackson, West Bromwich, attended on behalf of the company.

As to the North Staffordshire trade, I have this week only to report that notices have been posted at all the ironworks for a similar drop in wages to that which has occurred in the southern part of the county.

The Home Office have been unsuccessful in their prosecution of Mr. J. H. Price, certified manager, for incompetency and misconduct, resulting, the prosecution contended, in the late disastrous explosion at the Burley Pit, Apedale. Mr. W. Spooner, county court judge, held the Court, and before the case for the prosecution was concluded the judge announced that he and the assessor were agreed that there was no criminalising evidence, and dismissed the complaint, with costs against the Government.

This (Thursday) afternoon the Cannock Chase coalmasters held a meeting in Birmingham, and resolved to give their colliers notice of a drop in wages of 6d. per day. If their men should decline to accept the drop it will be enforced. The Cannock Chase and the Dudley coalmasters act independently in wages matters.

#### REPORT FROM DERBYSHIRE AND YORKSHIRE.

**Oct. 24.**—The week has been a most uneventful one so far as it relates to trade of every description, for there has been no change worth reporting. Lead mining has been fairly prosecuted, but the returns are below what they were some few years since, and at the present time, with lead at the price it is, cannot be considered at all favourable for speculating in mining operations. However, there are a few concerns which are doing very well, but many are doing just the reverse. The collieries in most parts of Derbyshire are now working better than they have done during the previous part of the year, and prices are rather higher. To London the trade is tolerably brisk, and a heavy tonnage is being sent over the Midland Railway to the depots, whilst a good deal is being put on to other lines. Clay Cross is sending fully 5000 tons a week to the Metropolis, and several others are sending 2500 tons a week. Merchants in London have been able to keep up prices to a point higher than during any previous part of the year, but this has not been shared in by the colliery owners. Steam coal is not so much enquired for, and only a moderate business is being done in steam qualities as well as in slack and smudge. The produce of the furnaces has been as usual, but the sales are not equal to it, whilst prices have in no way improved, and are far from being remunerative. More markets, however, have been found for it than formerly, but the competition with the makers of other districts does not tend to advance prices. The foundries are by no means busy, although several of them are able to keep their hands fully going. Bessemer rails are fully as busy as they have been, the output at Dronfield being heavy, and there is every appearance that this state of things will continue, for steel rails are increasing in request vice iron rails, which are fast dying out.

In Sheffield business has in no way improved, and the last quarter of the year promises to be more than usually dull. For some time past puddlers have been anything but well employed, and having been asked to submit to a reduction of wages, consequent on what has taken place in South Staffordshire, they have submitted to it after meeting together. Armour-plates have not improved, and a moderate production of ship and boiler plates only has to be noted. Sheffield plates are extensively used on the Clyde, and it is not unlikely that the recent failure of the bank may affect some of our makers, but as yet this has not been experienced at least to an appreciable extent. Makers of Bessemer continue busy, not only for rails, but for other purposes as well, for special qualities are now being made for cutlery of a certain class. Two or three houses engaged in making table and pocket knives are doing tolerably well, but this important branch taken altogether is very quiet. The home demand has been quiet, but Australia, India, and British North America have been taking considerable quantities from us, as well as tools and implements. In malleable iron business has been well maintained, and this important department, which has frequently been extended, has undergone less fluctuations than almost any other. In the Rotherham district the ironworks have been doing tolerably well, and the foundries in particular have been fairly well off in ordinary castings, whilst wagon builders have also been doing tolerably well.

Throughout South Yorkshire the collieries are much busier than they have been, and the London trade has improved. But as the coalowners have to depend very much on the Great Northern, the rate charged by that company is against any marked extension of business in that direction. The proposal of Mr. Thompson to take the coal by water to Boston, and then after being screened pass

sacks, and forwarded by water to the Thames direct, now that it is understood appears to be more feasible than it did. If one of our colliery owners could be induced to make the experiment no doubt he would be followed by others, even if the first was but slightly successful. But the great difficulty in getting out of the old track is to get some one to take the initiative, and colliery owners, like many other persons, want to see their way clear before venturing on a new and untried path. In steam coal steady business has been done, and shipments from Grimsby have been good for the season, whilst there has been no change with respect to other descriptions of coal. At several collieries work has been resumed where the men were on strike, and the relations between masters and workmen are now more satisfactory than they have been for a long time.

#### REPORT FROM MONMOUTHSHIRE AND SOUTH WALES.

*Oct. 24.*—Again another terrible catastrophe has occurred in our midst. By the accident on the Taff Vale at Pontypridd (in the Rhondda Valley) a dozen persons have been killed and numbers injured. The Taff Vale directors have always been noted for careful management, and since the opening of the line, some 30 or more years ago, this is the first accident of the kind that has happened. The Alexandra Dock directors are proceeding vigorously with their new timber pond at Newport, which will be opened in the course of a few weeks. A large development in the timber trade may be confidently looked forward to, as it is understood that the great railway companies having connection with the port are prepared to offer special facilities for buyers at a distance. Another word about Newport. The new metal market there was opened last week, and there was a fair amount of business transacted. Its establishment is likely to prove a great boon to those interested in the staple trades of the district.

Among the awards to local firms at the Paris Exhibition may be noted the following:—Abernant Ironworks and Collieries Company, Glynneath, silver medal for bricks; Cambrian Patent Fuel Company, Cardiff, honourable mention for patent fuel; Carmarthen Slate Company (Limited), Portmadoc, honourable mention for slates; Mr. David Davies, Crumlin, silver medal for steam striker; Messrs. D. and H. C. Evans, Swansea, honourable mention for anthracite coal; Great Western Colliery Company, Cardiff, honourable mention for coal; Messrs. E. Moorwood and Co., Llanelli, honourable mention for sheet-iron and tin; Messrs. Palmer, Morgan, and Co., Cardiff, honourable mention for coal; Messrs. A. Taylor and Co., Cardiff, honourable mention for coal; and Wayne's Merthyr Coal Company (Aberdare), silver medal for coal.

The Iron Trade shows no sign of improvement, but rather seems to get worse as time goes on. There is little or no demand for rails, and it is apparent more and more every day that only in exceptional cases do buyers order iron. Why should they, when steel, with its greater durability, can be obtained with such little difference in cost? What orders are in hand are being executed at very low rates. The bar trade is also dull, and no signs of an improvement are here visible; and some think that lower prices will have to be submitted to before trade regains anything like animation. Business at the steelworks is fairly good. There are some few indications of an alteration for the better in the Tin-Plate Trade. Prices have not altered, but they are a little firmer; and when the reactivation of trade comes into operation hopes are entertained of an improvement in quotations.

There is but little alteration in the coal industry, but business is slightly brisker this week. Shipments have been rather above the average, competition to sell, despite the low prices, is keen, and the output is large, although no change in quotations can be announced. The enquiry for steam qualities is good, and large quantities are shipped foreign; house coal is by no means in such good request as it ought to be at this season of the year. Patent fuel is quiet, but some fair orders are in hand.

The Penrhisieler Company, whose property is adjoining to that of Messrs. Nixon's and Co., have struck the 6-ft. coal, proving 7 ft. 8 in. thick, of excellent quality. This, with the 4-ft. seam won about three weeks ago, and which is 7 ft. thick, will make this property one of the finest collieries in the Aberdare district. The depth at which the coal was reached is 543 yards.

#### TRADE OF THE TYNE AND WEAR.

*Oct. 24.*—There is little change in the Coal Trade in Durham, rather more enquiry for coke may be noted, but many of the coking works have been very moderately employed of late. The demand for house coal has hardly improved so much as was expected a week ago. Shipments of gas coal at Tyne Dock, and other places on the Tyne, and at the Sunderland Docks, and also at Seaham, continue large. The new winning at Silksworth has been considerably developed, about 1500 tons of coal being worked per day, and arrangements are in progress which will result ultimately in the output of double that quantity. The sinking of the new shaft at Whitburn continues, and it is expected to be completed to the bottom of the water-bearing strata shortly. No general movement has yet been made towards a reduction in the wages of the Durham miners, but the men have got notice in some localities, and it is certain that the present rates cannot be much longer maintained. The margin of profit is so small where there is any at all that the fact is becoming recognised that some change is inevitable. The whole of the workmen employed at West Pelton Colliery, the property of Messrs. Joicey, have received a fortnight's notice to terminate their engagements. The notices, which will expire on Nov. 1, include both miners and also the workmen above bank. Between 200 and 300 men and boys will thus be thrown out of employment. It is not known what is the cause of the stoppage, as the colliery has been until recently working moderately well.

In Northumberland matters do not improve in the steam coal trade, the Dennington Colliery has not been restarted, and it appears probable that the works will be closed sometime. Notice has been given to the mechanics also at Seaton Burn and other places of an extension of the hours, and as the men threaten resistance some stoppage may result from this cause. The Northumberland coal-owners held a meeting in the Coal Trade offices on Saturday to consider the present state of trade in the county. After discussion the secretary, Mr. Thomas W. Bunning, was instructed to send the following circular to the secretary of the Northumberland Miners' Union. "I am desired to inform you that the owners will be obliged if you will kindly send a deputation here next Saturday, the 26th inst., to discuss with them matters in reference to the depressed condition of trade, and especially to consider whether some improvement cannot be effected by increasing the working hours, and reducing the present rate of wages." From the above it will be seen that no definite amount of reduction is stated, but it is said that at least 10 per cent. will be asked.

The best steam coal at present only realises 9s. per ton, and good medium sorts 8s. The competition between those coals and South Wales coals is very keen at present, and this is likely enough to ruin both interests. Only one colliery at present ships the coal at Blyth on the north side of the river, and they thus gain more than 1s. per ton over those who ship in the Tyne from that district. What is urgently required is the improvement of the harbour at Blyth, and short railways from the works in that district to connect them with this harbour. The new railway on the north side of the Tyne from Byker to Walker and Percy Main is to be opened shortly, and a new trade to the district is to be started at St. Peter's Station on this railway—an extensive spinning factory.

There was a better attendance at Middlesborough on Tuesday than at some recent markets, but the business was very quiet, and but little iron now changes hands, the most that is being done being relegated to second hands, who offer iron at below makers' rates. As was the case last week, some of the merchants offer No. 3 at 37s. to 37s. 3d. net, but makers ask generally 38s. 6d., less commission, though some who are rather pressed would take 38s. Forge iron is rather scarcer, and slightly in excess of the ordinary rates as compared with No. 3. Both makers and larger merchants are inclined to adopt a waiting policy. Though the Scotch pig market still shows

lower rates, the deliveries from Cleveland of pig-iron have not diminished; last week they amounted to over 5200 tons more than was sent at the corresponding period of the previous year. The Scotch market is, however, too low to admit of fresh purchases of Cleveland iron, the deliveries now made being in pursuance of old contracts. Fair shipments continue to be made on foreign account. Trade, however, is limited all round by the prevailing commercial uneasiness, and merchants and traders of all descriptions are restricting the transactions within narrower and comparatively safer lines. There is scarcely any speculation in progress. The general tone of trade is, however, healthy, there having been no failure since the commercial crisis in the trade of this district. Some additions are being made to the foundry and smaller class of steelworks in the district, and the large steel rail mills of Bolckow, Vaughan, and Co. are fully employed, and have a large order in execution for the North-Eastern Railway. There is no demand now reported for iron rails except for colliery and tramway purposes. The ship-plate trade is moderately active. Hopkins, Gilkes, and Co. have just laid down a new mill for making a superior class of plates from Danks' iron. The pipe manufacturers are doing an active trade, and general founders seem to have rather more employment. Prices of finished iron unaltered.

#### ELECTRIC ILLUMINATION.

The lodging during the week of Mr. T. A. Edison's petition for an English patent, a "method and means for developing electric currents and lighting by electricity," affords assurance that at least, at the end of six months from its date, it will be known whether he has made any real progress, and if so what amount of progress towards rendering electric illumination practicable. It is remarkable that the title does not, although the provisional specification nevertheless may, contain any reference to the sub-division of currents, which is the more significant as a week previously Mr. Antoine Arnaud actually applied for a patent for "indefinitely dividing electric currents," and experiments have since been made in London by him which were considered not unsatisfactory by those who witnessed them. Mr. C. W. Siemens has also applied for a patent for "improved means and apparatus for electric illumination," and during the week a trial has also been made by the Rapieff lamp, the invention of a Russian gentleman, Mr. J. Rapieff. In this lamp the carbon rods which sustain the lamp are four in number, arranged in two pairs, each pair forming an angle like the letter V. One pair is turned upside down over the other, so that the two apices meet in a common centre. The arrangement would then resemble a letter X, were it not that while one pair has its broadside towards the spectator the other pair presents its edge. Where the four carbons meet—or rather converge—there is the light. Of course if the two pairs of carbons were actually to touch each other the current would pass without causing more than some degree of incandescence, but being adjusted to a proper distance the carbons serve to sustain the light, the electric arc being formed between the apices. By means of a counter-weight operating on a fine endless cord the carbons are drawn over friction wheels and left in their right position. A set-screw provides for the due adjustment of the carbons, so as to regulate the length of the electric arc. In the event of the current being interrupted by any casualty an electromagnetic arrangement comes into operation, which instantly restores the current and re-establishes the light. The carbons may be of considerable length, so as to last from seven to ten hours. As one of the carbons can be removed and another substituted without interrupting the current, the duration of the light may in that way be made continuous. But without any manipulation the carbons will sustain the light for the number of hours already specified. Through the agency of the set-screw there is an extraordinary amount of control exercised over the light, corresponding in some degree to the effect of the ordinary tap for regulating the size of a gas flame.

An important feature claimed for the Rapieff lamp is that the intensity of the light can be varied at pleasure—a claim which few will be inclined to admit without ocular demonstration, since hitherto it has been found in practice that with any given lamp it has been compulsory to keep it at its best, or lose the light altogether. And there is another curiosity to be explained, which is that, assuming the Rapieff lamp to possess the extraordinary peculiarity mentioned, nothing more has been done to make the discovery known during the eleven months the patent has been in force. It is probable that as much nonsense—such as the light emitted from the incandescent carbons modifying the colour of the light due to the current—has been written about the Rapieff as about the Edison discovery. It has been declared that the Rapieff light is "brilliant and clear, without the presence of any blue rays," and that "predominance is given to the light emitted by the incandescent carbons," but these are evidently due to want of knowledge of those who made them as to the essential properties of both light and electricity. It is further stated that the Rapieff light has lately been seen in London by Mr. Fontaine, who highly approved the steadiness with which it burned. An important feature in the arrangement is said to be that the extinction of one or more of the lamps in the series leaves the rest still burning, but this is only what was unfortunately proved at the Jablochhoff experiments at Shoreditch a fortnight since—two of the lamps went out some minutes before the remaining four ceased to act. Again, in the Rapieff, as in the Jablochhoff experiments, a couple of Gramme machines were used but the actual horse power employed was not ascertained, although it was evident in both cases that more power was used than was desirable to state.

The failure of the Farmer-Wallace experiments at Plough-yard, Shoreditch, was noticed in last week's Journal, and reference was made to Mr. Ladd's ability to make any philosophical experiment "go" if there were any "go" in it; it will, therefore, be interesting to know Mr. Ladd's views as to the future of electric illumination. He states that in consequence of having had much experience with the subject, many persons are applying to him to ask if the electric light is going to supersede gas. One gentleman stated a company had bought a field for the purpose of building a gasworks; they were now afraid to do so. Gas directors have come for information to lay before their next meeting, and he is compelled to have an extensive correspondence, all showing the panic in connection with gas as well as electric light. That electric light will take the place of gas for large spaces, railway stations, halls, workshops, and such places there can be no doubt; but the present state of our electrical knowledge holds out no hope of its ever superseding the present system of house lighting and other domestic purposes. He collects the time railways were to do away with the use of horses, and machinery with hand labour, and the same has been the case with every new stride; and so now those who can least afford to lose their incomes are selling their gas shares to those who are more shrewd, and can see further ahead. Mr. Ladd said to one gas director he supposed he was buying shares, and his answer was "If I had any spare cash I would lay it all out in gas shares at once." His object in writing is to try and persuade those who have gas shares to keep them.

Such an opinion from a man like Mr. Ladd ought to leave no doubt as to the position of the question of electricity against gas, and he will probably admit that he might have added that with our present knowledge of electricity, and the cost of generating it, even the Jablochhoff light is applicable only where the cost of the light is of little or no consideration. At the St. Lazare Station, in Paris, the Jablochhoff light has been substituted for gas it is true, but the cost is stated to be more than double that of the gas lights replaced, and which were ample for the requirements.

Even the absolute novelty of the principle upon which is based the system of illumination which is creating so much noise is far less than many suppose, for Fontaine mentions King's patent of 1845 as tending to prove that magneto-electric machines powerful enough to produce light already existed in 1845. King's invention had for its basis the use of metallic conductors, or of continuous carbons, heated to whiteness by the passage of an electric current. The principle of lighting by means of incandescence was tried by several inventors subsequent to King, but no real progress seems to have been made until about five years back, when another light

of the same class made some noise; and many of the patents applied for within the last month really appear from the titles, which are at present all that can be seen, to be doing little more than reviving attempts which have been tried and failed many years ago. Among the patents recently applied for on the subject, Colonel Lane Fox claims "improvements in obtaining light by electricity and in conveying, distributing, measuring, and regulating the electric current for the same, and in the means or apparatus employed," besides "improvements in the application of electricity to lighting and heating purposes." Two other inventors, Messrs. Aronson and Farnie, think they have discovered "an imperishable substitute for carbon," especially adapted to electric illumination. It is needless to say that no discovery in this field could be more important than this, if its promise can only be made good. It is to be borne in mind that although the electric light consumes pure carbon in a very expensive fashion, it does not consume it in the slightest degree in the character of fuel. It is simply a conductor, but a conductor subject to waste. If, therefore, the carbon points of Mr. Lontin and Mr. Rapieff, or the parallel edges of Mr. Wallace's "carbon-plate lamp," could be rendered absolutely indestructible, instead of gradually wearing away as they now do, the light would be in no wise impaired, while an immense step would have been gained in the power of keeping the negative and positive poles uniformly at the distance most favourable to the strength and brilliancy of the voltaic arc.

But it cannot be too strongly urged, as it has been already in the *Mining Journal*, that commercially considered neither the placing of several lamps on one circuit, nor the cost of the carbons consumed, are the real points at issue. The great question is the minimum cost per lamp at which the electricity can be generated, and although no direct answer has yet been given to the question it may be concluded from indirect statements which have been authoritatively made that as a general illuminating agent electricity would cost from 20 to 25 times the price of gas. As to the brilliancy of the light there can be no question; but in this connection the City of London have received a very instructive and significant report. Mr. Haywood considers that in the present state of things the use of opalescent globes is absolutely necessary, and, therefore, remarks that one-half the nominal intensity of the light will be always lost, "a point also to be held in mind," he observes, "in considering its practical illuminating power compared with that of coal gas." In reference to the extraordianr illumination of the Avenue de l'Opera at Paris, Mr. Haywood says it is brilliant in the extreme, but he goes on to show that it could not be otherwise, seeing that the amount of light was nominally equal to 6100 gas burners in a thoroughfare not three-fifths of a mile long. This is placed in juxtaposition with the fact that the whole City of London has only about 3050 gas lamps, though the burners are, perhaps, somewhat larger than those which exist in Paris, and the gas in the City is brighter than that of the French capital, the lighting power of the former being at least 16 candles, while the Paris gas is only equal to 12 candles on the same standard.

#### THE APEDALE COLLIERY ACCIDENT. GOVERNMENT ENQUIRY.

An enquiry, directed by the Home Secretary, was held at Stoke-on-Trent, on Saturday, in reference to the gas explosion at the Burley Pit, Apedale, on March 27, when 23 men and boys were killed. The inquiry, which amounted to a prosecution of the manager of the colliery, Mr. James Henry Price, was heard before Mr. W. Spooner, judge of the County Court, assisted by Mr. Evans, Government Inspector of Mines for the Derbyshire district. Mr. Booth appeared for the Home Office, and Mr. J. Underhill (instructed by Mr. Welch) for the accused. A good number of mining engineers and managers were present during the hearing of the case.

Mr. Booth explained that the charges against Mr. Price, of incompetency and mismanagement, were laid under the 32nd section of the Coal Mines Regulation Act, and were as follows:—(1) That the defendant, having the daily supervision of the mine, did not, on March 27, cause an adequate amount of ventilation to be constantly produced in the pit, to dilute and render harmless noxious gas to such an extent that the working places and roads of such mines should be in a fit state for working and passing therein; (2) that the defendant did permit the return air used for the ventilation of the colliery to pass up a dumb drift, and over the furnace of the upcast shaft, the outlet of the dumb drift into the upcast shaft being so near to the fire of the furnace that there was at all times a danger of an explosion happening if the return air used for ventilating the pit should become so charged as to be explosive; (3) that the defendant did, on March 26, permit a thriling or air passageway to be cut through from the north dips of the colliery into a bower called the furnace dip, by means of which the air of the north dips had its course considerably shortened, and was taken more directly to the upcast shaft, the effect being to decrease the opportunity for the gas which was carried away in the current and ventilation to become thoroughly diluted by mixing with the air; (4) that in consequence of the defendant's neglect and mismanagement an explosion occurred, whereby 23 men and boys were killed, and the lives of other workmen were seriously endangered.

Mr. J. C. Cadman, mining surveyor, in the employ of Messrs. Stanier and Co., produced plans of the Burley pit, and explained the workings and ventilating arrangements. The defendant had been manager about 2½ years, and before that was assistant to Mr. Bostock, the former manager. Mr. Bostock planned the workings. The top of the arch of the side drift was 8 ft. higher than the top of the arch of the furnace. By Mr. Underhill: He attended the inquest in this case. It was a very full enquiry, and the jury added to their verdict that there was no positive evidence to show how or where the gas accumulated or how or where it exploded, and that there did not appear to be any blame attached to the management of the pit. He considered the ventilation very good on March 22. The quantity of air going into the pit was 110,000 cubic feet per minute. Men had complained of there being too much draught in the pit, and he had heard of a man obstructing the ventilation. Mr. Price had carried on the works as Mr. Bostock had planned them.

John Shenton, head boy at the pit at the time of the explosion, said the accident took place in the 8-ft. seam. The reports of the mine for March 27 were that the workings were quite clear of gas. He (witness) examined the whole of the lamps that morning, and they were all locked and in good order. He had never heard any complaint of gas in the pit.—Cross-examined: Before this explosion he always considered it was a well-conducted colliery, with plenty of air in it. There was only one complaint, and that was that there was too much air. One workman was punished for checking the ventilation. He saw nothing up to the time of the explosion to give him any idea that the circulation was in any way impeded. There was no warning of any accumulation of gas. Where there was an accumulation it almost always gave warning. The 8-ft. seam was a very dusty seam, and the dust mixed with gas was explosive. From 23,000 to 25,000 ft. of air would go down into the 8-ft. seam per minute, which would be about 1000 ft. per man. That was thought sufficient.—Re-examined: He had never heard of dust exploding, except when mixed with gas.

Mr. Wynne, Government Inspector of Mines, said he was of opinion that the gas exploded at the furnace, and that gas escaping from a fault had made its way straight on the furnace. The thriling rendered the mine positively dangerous, because the gas, instead of circulating and mixing with the fresh air, went straight to the furnace, and that was the cause of the explosion. He considered the making of the thriling evidence of incompetency on the part of the manager. Such a change ought never to have been made until the ventilation had been placed on a better footing. The passage of foul air over the furnace ought not to have been allowed. Mr. Wynne was examined at great length with a view of showing that he had been well aware of the mode of ventilation in the mine, and had sanctioned it by not interfering with it. He said he told Mr. Bostock, the former manager, 2½ years ago, that the principle of ventilation was very bad; but he had not been down the pit since then until this explosion, and he could not remember whether there was a furnace when he first visited the pit. He had heard of the system of ventilation

lation in use, and he had not condemned it, because he understood the owners were about to construct a fan. The furnace might have been sufficient if the thriling had not been cut, and there was no necessity to condemn the system when they were doing all they could to remedy the defect. Later on Mr. Wynne said there would have been no enquiry into Mr. Price's conduct if it had been left to him. Mr. Booth said the enquiry had been ordered at the suggestion of Mr. Maule, Q.C.

Shenton, recalled, said the furnace was put up by Mr. Bostock.

Mr. S. B. Gilroy, Assistant-Inspector, said he was of opinion that the explosion was caused by the firing or shot. The thriling would have been an advantage except in the case of a sudden and unusual influx of gas, when it would be a danger. Coal dust was a very serious auxiliary to fire in an explosion. It was thought that the air in the mine was sufficient for general purposes, and as the owners were constructing a fan it was not thought desirable to interfere.—Cross-examined: He did not think that dust alone would explode.

At this stage of the proceedings Mr. Spooner said it was a very proper thing that the enquiry should take place; but both himself and his assessor agreed that there was no evidence of incompetence or gross negligence. He could not possibly say that Mr. Price was not fit to be trusted with the management of a mine. The case would be dismissed.

This announcement elicited loud applauses from the audience at the back of the court.—Mr. Underhill asked for costs, and an order for costs was made upon the Treasury. The result of this application also was much applauded.—The Court sat from eleven to five.

#### CHESTERFIELD AND DERBYSHIRE INSTITUTE OF MINING ENGINEERS.

The quarterly meeting of members was held at the Angel Hotel, Chesterfield, on Saturday. Lord Edward Cavendish, the President of the association, was unavoidably absent, and the chair was taken by Mr. J. P. Jackson, J.P. The following gentleman were declared to have been duly elected members of the association:—Mr. Joseph Bullock, Eastwood, Notts.; Mr. W. H. Fairburn, Rhymney Ironworks; Mr. W. Johnson, telegraph engineer, Sheffield; Mr. George Kemp, Clay Cross; Mr. Thomas Kitchens, Dronfield; Mr. Nathan Mellers Newton, Alfreton; Mr. W. A. Tyzack, Sheffield; Mr. J. C. Wild, Ellistoun Collieries, Leicester; Mr. W. Wilson, jun., Sheffield; and Mr. W. Durton, Loughborough. Mr. George Bramley, Clay Cross, was also elected an honorary member.

A paper by Mr. D. P. Morison, on the "Results of some Experiments on the Effects of Coal Dust in Colliery Explosions," was read and discussed at a previous meeting, remained open for further discussion. A letter from Mr. Morison was read, stating his inability to be present to reply to the criticisms on the paper at the former meeting, and enclosing a few observations in writing, which were read by the secretary, and on the suggestion of the Chairman further discussion on the subject was postponed until the next quarterly meeting.

Mr. J. A. Longden's paper on "Colliery Brickworks" did not elicit any further discussion, and was declared closed.

A very interesting discussion then took place on Mr. A. H. Stokes' paper entitled "Economic Geology of Derbyshire," in which the Rev. J. M. Mello, Mr. J. A. Longden, Mr. Crowdace, Mr. Coke, and the Chairman took part, and much valuable information relative to the geology of the county was the product; indeed it was generally admitted that this paper and the discussions thereon were amongst the most important and valuable of the transactions of the Institute.

A paper on "Schram's Rock-Boring and Air-Compressing Machinery," written by Mr. Richard Schram, was read by Mr. Howard in the absence of the author.

#### THE WEST OF ENGLAND COMPRESSED PEAT COMPANY.

We have on several occasions referred to the progress of this successful company, and it may be fairly looked upon, in these times of commercial depression, as a proof that when an undertaking with a fair prospect of success is placed before the investing public there is no lack of support. It is barely six months since this company was incorporated, starting, it is true, under unusually favourable auspices, for we see amongst the directorate the names of Major Hinton, a gentleman who has spent much time and money in endeavouring to show the vast importance of the utilisation of peat; Mr. Alderman Head, who has been thrice in succession elected Mayor of the City of Exeter; and William Greene, Esq., brother to Benjamin B. Greene, a Governor of the Bank of England, and also to Edward Greene, M.P. for Bury St. Edmunds. The capital of this company was quickly subscribed for at par, and as the operations of the company advanced quickly went to premium, and are now freely bought and sold at about 25 per cent. above par, the advancing value being anticipated by London firm, which secured at the outset a considerable number in the interest of their clients. Of course, there are many reasons to justify these steadily advancing quotations. The Dartmoor peat is considered as differing vastly from the generality of peat; its density and nearest approach to the carboniferous slate makes it more valuable as a charcoal and for fuel generally. The immense thickness of the beds—in some instances 30 ft.—and the facilities by which these great deposits can be drained from the heights of Dartmoor, all tend to add to the elements of success; but the great feature in the enterprise is the railway now in course of construction, which will connect the peat beds with our entire railway system; and the high favour in which the undertaking is held was clearly shown by the important gathering of so many prominent men of the county of Devon and other parts a few weeks back at the turning of the first sod of the Peat Railway by the High Sheriff of the county. There were several mayors, magistrates, and other representatives of corporate bodies, including that of the City of London, and the whole proceedings and speeches were all of the most gratifying and interesting nature. We are not sufficiently acquainted with the working and cost of production as many of the speakers undoubtedly were; but if only one half of the success so reasonably predicted is attained, there is nothing to prevent the shares in this company doubling their present price; for depend upon it, although peat can be sold at a much less price than coal, its cleanliness and wholesome character, so warmly commended by the faculty from a sanitary point of view, will always procure for it a ready sale, where the price will be a secondary consideration. It was our pleasing duty to recommend this enterprise on its advent, and we sincerely congratulate all concerned on the progress made in what we conceive to be the opening up of a most important field of national industry.

**TAKING LEVELS FOR DRESSING FLOORS AND BUILDINGS.**—A simple and ingenious little apparatus for taking and indicating levels and perpendiculars for buildings and similar purposes has been invented by Mr. JOHN RYAN, of Battersea, who proposes to take a board of wood of a suitable length (or it may be a length of metal or other suitable material), the edges of which are planed or made perfectly level and true one with the other. In the centre a dial is set in or mounted, arranged with divisions to indicate the level or amount of the angle of any horizontal or perpendicular line upon which the edge of the levelling instrument is placed. A pointer is mounted upon an axis in the centre of the dial, the opposite end of the pointer being weighted so as to cause it to assume a perpendicular position at all times by its own gravity, and thus indicate upon the dial level perpendicular and angular lines, according to the position in which the instrument is placed.

**MANUFACTURE OF IRON AND STEEL.**—Mr. JAMES NOAD, of Plaistow, proposes to prepare from iron a hydrated peroxide of iron by forming heaps or beds of the metal, and keeping it moist with water or a saline solution, and in some cases he hastens the oxidation of the iron by the application of a galvanic battery. He takes the hydrated peroxide thus obtained and reduces it to fine powder, and thus employs the finely powdered oxide—he places at the bottom of a crucible a quantity of the oxide, and over it places cast-iron;

he heats the crucible in a furnace until the iron is melted, and as soon as it has been acted upon by the oxide he casts the metal into ingot moulds. The ingots thus obtained he employs in the manufacture of steel by remelting them with iron or steel scrap, in suitable proportions, according to the quality of the steel required. He also employs the hydrated oxide of iron, obtained as above described, in the refining of iron, and this he does by lining or covering the hearth or bed of the furnace with the oxide, so that the melted metal may come into contact with it.

#### In the Court of the Vice-Warden of the Stannaries. Stannaries of Cornwall.

**IN the MATTER of the COMPANIES ACT, 1862, and of the TREMENHEERE MINING COMPANY.—ALL CREDITORS or CLAIMANTS** of the above named company, who have not received notices from the Official Liquidator thereof that their claims have been already admitted, are hereby required to COME IN and PROVE their SEVERAL DEBTS or CLAIMS at the Registrar's Office, Truro, on Saturday, the 2nd day of November next, at Eleven o'clock in the forenoon, or in default thereof they will be EXCLUDED from the BENEFIT of any DISTRIBUTION made before such proof. And for the purpose of such proof they are to attend in person, or by their solicitors or competent agents, at the time and place above mentioned.

FREDERICK MARSHALL, Registrar.

Dated Registrar's Office, Truro, October 22, 1878.

#### In the Court of the Vice-Warden of the Stannaries. Stannaries of Cornwall.

**IN the MATTER of the COMPANIES ACT, 1862, and of the SOUTH WHEAL MARGARET MINING COMPANY.—ALL CREDITORS or CLAIMANTS** of the above-named company, who have not received notice from the Official Liquidator thereof that their claims have been already admitted, are hereby required to COME IN and PROVE their SEVERAL DEBTS or CLAIMS at the Registrar's Office, Truro, on Saturday, the 2nd day of November next, at Eleven o'clock in the forenoon, or in default thereof, they will be EXCLUDED from the BENEFIT of any DISTRIBUTION made before such proof. And for the purpose of such proof they are to attend in person, or by their solicitors or competent agents, at the time and place above mentioned.

FREDERICK MARSHALL, Registrar.

Dated Registrar's Office, Truro, the 24th day of October, 1878.

#### In the Court of the Vice-Warden of the Stannaries. Stannaries of Cornwall.

**IN the MATTER of the COMPANIES ACT, 1862, and of the NEW ROSEWARNE MINING COMPANY.—By the direction of His Honor the Vice-Warden, Notice is hereby given, that on the 6th day of November next, at the Registrar's Office, at Truro, in the county of Cornwall, at Eleven o'clock in the forenoon, this Court will proceed to MAKE a CALL of ONE POUND TWO SHILLINGS PER SHARE on all the contributors of the said company, settled on the List of Contributors as present members thereof.**

All persons interested therein are entitled to attend at the time and place above said to offer objections to such call.

JOHN HENRY HAMLEY, Official Liquidator.

Dated Stannaries Court Office, Truro, October 24th, 1878.

#### WEST TANKERVILLE MINING COMPANY (LIMITED).

##### IN LIQUIDATION.

**A LL PERSONS** claiming to be CREDITORS of the WEST TANKERVILLE MINING COMPANY (LIMITED) are required, on or before the 9th November, 1878, to send a notice, in writing, containing their NAMES and ADDRESSES, and the particulars of their DEBTS or CLAIMS, addressed to the Liquidators of the West Tankerville Mining Company (Limited), 8, Austin Friars, London; or, in default thereof, they will be EXCLUDED from the BENEFIT of any DISTRIBUTION of ASSETS made before such notice shall be received.

WILLIAM EDWARDS, & J. H. MURCHISON, Liquidators.

Dated this 23rd day of October, 1878.

#### TO COLLIER PROPRIETORS, MACHINISTS, AND OTHERS. CHRISTIONYDD AND AVONEITHA COLLIERIES, NEAR RUABON.

**M R. W. H. HILL WILL SELL, BY AUCTION,** on Tuesday, October 29, 1878, on the several banks of the above pits, which are situated about a mile from Ruabon Station, on the Great Western Railway, the WHOLE of the VALUABLE

#### MACHINERY AND PLANT,

Consisting of excellent VERTICAL WINDING ENGINES, steam pipes and connections complete; PUMPING ENGINES; drums for round and flat ropes; EGG END BOILERS; pit heads and pulleys; conducting rods; tiplers; carriers; pit bank and road weighing machines; windlass; landing plates; several hundred yards of flat and round wire ropes; a large quantity of various tram rails; tipping wagons; trolleys and pyches; the several buildings and erections of brick and slate; sundry old iron and timber; several pieces of office furniture; and numerous other effects, which are fully described in catalogues to be had seven days prior to the sale from the offices of the Auctioneer, Brook-street, Oswestry.

John Phillips, Stryd-issa, Ruabon, will, on receiving a clear day's notice, by letter or otherwise, be prepared to show the several lots.

Sale to commence at Twelve o'clock punctually.

#### FOR SALE.

#### VALUABLE IRONWORKS AND MINERAL LANDS.

**T HE PERU STEEL AND IRON COMPANY OFFER FOR SALE** ALL THEIR PROPERTY and ESTATE, situated in the counties of ESSEX and CLINTON, State of NEW YORK, U.S.A., comprising over 21,000 acres of WOOD and FARM LANDS, the buildings, structures, and erections upon such lands, with the FORGES, FURNACES, ROLLING MILLS, MACHINERY, gearing, and fixtures appertaining to and contained in such buildings, the LEASEHOLD INTERESTS, the MINERAL, ORE, and MINING INTERESTS, rights, and reservations, the DAM, the interests, rights, and privileges in LAKES, RIVERS, and other waters, the WHARVES and the ROADS.

For further description of the property, terms, &c., address to NILS MITANDER, Selling Agent by Power of Attorney, care of R. ALBUTZ, Esq., 57, Gracechurch-street, London, E.C.

**Q UARRY—SLATE AND FIRE-CLAY—TO BE SOLD, IN NORTH WALES.** 250 acres, in full working order. Turning out with present small staff (16 hands) 30,000 slates per month. Two miles from rail. £2700 has been expended in plant, &c., the inventory of which includes some valuable MACHINERY, ROLLING STOCK, and accessories. Lease 42 years to run. Price £10,000; two-thirds may remain at a low rate of interest.

For full particulars, apply to Mr. GEORGE F. HARRINGTON, 17, New Bridge-street, Blackfriars (nearly opposite Ludgate Hill Station).

**F OR SALE, BY PRIVATE CONTRACT,** an existing LEASE, on low royalties, for a long term of years, of the No. 3 RHONDDA and STEAM COAL SEAMS, lying under compact single mineral property of NEARLY SEVEN HUNDRED ACRES in extent, situated in the county of GLAMORGAN, adjoining and connected with a public line of railway.

Also, OPENED LEVELS upon the No. 2 RHONDDA SEAM of COAL, in the same property, with the PLANT, BUILDINGS, TWENTY WORKMEN'S HOUSES, MANAGER'S HOUSE, and PUBLIC HOUSE.

The depth to the No. 3 Rhondda, near the deep side of the property, is estimated to be under 100 yards.

Also, LEASE of the SURFACE, which is well wooded and watered. The Farming Stock upon the premises to be taken at a valuation.

For further particulars and to treat, apply to Messrs. BROWN and ADAMS, Guildhall Chambers, Cardiff.

#### TO CAPITALISTS.

**F OR SALE, A SILVER-LEAD MINE,** situated in CORNWALL, in the same strata of silver-lead bearing ground as the celebrated Wheal Mary Ann and Trelawny Mines. Prospects excellent. Easy price and terms. Apply to R. J. RUTTER, 5, Pyne's Terrace, St. David's, Exeter.

#### HORIZONTAL ENGINE.

**A STRONG, WELL-FINISHED ENGINE,** 12½ inch cylinder, 2 feet stroke, with fly wheel, wrought crank shaft, 5 inch diameter, governor, and massive box bed.

Price ... ... ... £76.

#### ALEXANDER SMITH, ENGINEER, DUDLEY.

**18 H.P. PORTABLE STEAM ENGINE,** with link motion reversing gear, ready for delivery; also gear to wind and pump.

A 9-h.p. VERTICAL STEAM ENGINE, with link motion, reversing gear (windings drum if required).

A 6-ft. PAN MORTAR MILL, VERTICAL ENGINE, and BOILER, with carriage and travelling wheels.

Apply to BARROWS AND STEWART, ENGINEERS, BANBURY.

#### GUANO! GUANO! GUANO!

**T HE CONTRACT NOW IN COURSE OF EXECUTION** for the EXTRACTION and EXPORTATION of GUANO from MELILLONES, expiring in March, 1879, the GOVERNMENTS of CHILE and BOLIVIA have FIXED the date of January 15th, 1879, for the SALE, BY PUBLIC COMPETITION of FOUR HUNDRED THOUSAND TONS of the said GUANO.

The sale will take place at Santiago at the above-mentioned date.

The particulars and conditions of sale, and also the results obtained from the said Guano through reliable scientific analysis, may be consulted at the Chilean Consulate, Gresham House, London, E.C.

#### COAL MINES REGULATION ACT, 1872.

##### EXAMINATION FOR MANAGERS' CERTIFICATES OF COMPETENCY.

##### DISTRICT UNDER THE CHARGE OF THOMAS EVANS, Esq.

H.M. INSPECTOR OF MINES.

**N**OTICE IS HEREBY GIVEN, that an EXAMINATION for MANAGERS' CERTIFICATES OF COMPETENCY, under the above-named Act, will be HELD on the 30th and 31st days of October, 1878, and CANDIDATES INTENDING TO PRESENT THEMSELVES at such Examination must, on or before the 29th day of October, notify such intention to the Secretary of the Board of the above mentioned District, from whom all information as to particulars can be obtained.

By order of the Board,

WILLIAM SAUNDERS, Secretary.

N.B.—Persons who do not reside within the District are equally eligible for examination with those who do.

Mr. E. JACKSON,

Associate of the Royal School of Mines.

A N A L Y S T A N D A S S A Y E R .

Assays or Complete Analyses made of Copper, Silver, Lead, Zinc, Tin, and other Ores.

ASSAYING TAUGHT.

106, QUEEN VICTORIA STREET, LONDON, E.C.

#### HENRY WIGGIN AND CO.

(LATE EVANS AND ASKIN),

NICKEL AND COBALT REFINERS  
BIRMINGHAM.

#### ENOCH AND RICHARD PARRY.

MINING AGENTS AND SURVEYORS,

MINSTERLEY, SHROPSHIRE.

Mines inspected and reported on at home and abroad.

#### THOMAS BROTHERS,

MINING SHAREBROKERS AND MINERAL SURVEYORS,

STRAND CHAMBERS,

STRAND STREET, LIVERPOOL.

R. B. HARPER,

MINING ENGINEER,

Will SUPERINTEND or EXAMINE and REPORT on MINES on the PACIFIC COAST. Having had 14 years' experience in Gold and Silver Mining in Mexico, California, and Nevada. Government Mining Engineer for the Province of British Columbia.

Any communications may be addressed Room 49, Nevada Block, San Francisco, California.

#### C. H. WALKER AND CO.,

MINING AGENTS AND ENGINEERS,

VALPARAISO AND SAN IAGO,

CHILE.

#### CALIFORNIAN AND EUROPEAN AGENCY,

205, LEIDESDORFFST, SAN FRANCISCO, CALIFORNIA.

THIS AGENCY is prepared to make Investments in approved REAL ESTATE, MINING PROPERTIES, MINING STOCKS, &c., and to INVEST MONEY in FIRST-CLASS SECURITIES in CALIFORNIA, and the neighbouring States.

Also to AFFORD INFORMATION and ADVICE to parties abroad who may contemplate or may have already invested in Enterprises

**ALEXR. WILSON & CO.,**  
VAUXHALL IRONWORKS,  
L O N D O N , S.W.,  
MANUFACTURERS OF  
THE VAUXHALL DONKEY PUMPS.  
THE EXCELSIOR DIRECT-ACTING  
PUMPS.  
HIGH-PRESSURE SCREW ENGINES  
COMPOUND SCREWS ENGINES.  
PATENT SURFACE CONDENSING  
ENGINES.  
PATENT PADDLE ENGINES.  
HOISTING MACHINERY.

ILLUSTRATED AND PRICED CATALOGUES ON APPLICATION.

**LAMBERT BROTHERS,**  
Alpha Tube and Fitting Works,  
WALSALL.

Boiler Tubes, Hydraulic Tubes,  
Sluice Valves, Hydrants,  
Stop and Draw-off Cocks,  
Boiler Mountings,  
Safety Valves, Pumps, &c.

**FIRST PRIZE MEDAL,**  
ROYAL CORNWALL POLYTECHNIC SOCIETY, 1878.

Rate of Drilling, three to  
four times as fast  
as hand  
labour.

**JORDAN'S HAND POWER ROCK DRILL.**  
SPECIALITIES—  
PATENT PNEUMATIC  
HAND & STEAM POWER  
STAMPS, CRUSHING ROLLS,  
PATENT PROSPECTING PLANT, &c.  
T. B. JORDAN, SON, AND MEIHE,  
ENGINEERS AND CONTRACTORS,  
63, QUEEN VICTORIA STREET, LONDON, E.C.,  
AND AT  
21 AND 22, LINDENSTRASSE, BERLIN, S.W.

AWARDED HONOURABLE MENTION AT THE PARIS  
EXHIBITION.

**M I N E R S' L A M P**  
AND  
GAUZE MANUFACTORY,  
Established Half-a-century.  
JOSH. COOKE AND CO. **J.C.** TRADE MARK  
**SAFETY LAMPS**  
A Show Case of Lamps is to be seen at Paris Exhibition, Class 50.  
Illustrated Price Lists free, by post or otherwise.  
**MIDLAND DAVY LAMP WORKS,**  
BELMONT PASSAGE, LAWLEY STREET,  
B I R M I N G H A M .

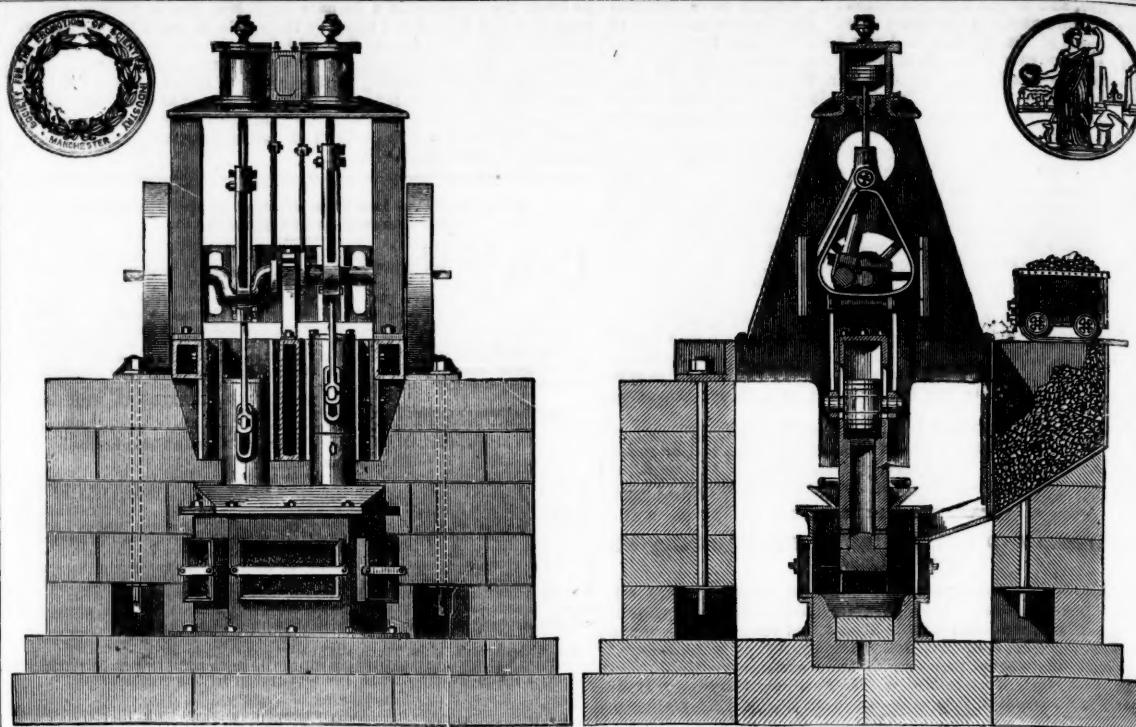
**JOHN BEATSON AND SON,**  
IRONGATE, DERBY.



IRON AND STEEL RAILS, of all sections, from 10 to 82 lbs. per yard, new, defective, or second-hand.  
POINTS AND CROSSINGS, FISH PLATES, BOLTS, NUTS, CHAIRS, AND SPIKES.  
DERBYSHIRE, YORKSHIRE, HEMATITE, SCOTCH, AND COLD-BLAST PIG-IRON.  
STEEL AND MALLEABLE IRON, of all qualities and sections.  
Delivered at all Ports and Railway Stations in Great Britain.

**S T E A M B O A T ACCIDENTS! RAILWAY ACCIDENTS!**  
ACCIDENTS OF ALL KINDS!  
Insured against by the  
RAILWAY PASSENGERS ASSURANCE COMPANY,  
The Oldest and Largest Accidental Assurance Company.  
The Right Hon. LORD KINNAIRD, Chairman.  
SUBSCRIBED CAPITAL £1,000,000.  
ANNUAL INCOME, £210,000.  
A fixed sum in case of death by accident, and a weekly allowance in the event of injury, may be secured at moderate premiums.  
BONUS ALLOWED TO INSURERS OF FIVE YEARS' STANDING.  
ACCIDENTS OCCUR DAILY! £1,200,000 have been paid as compensation.  
Apply to the Clerks at the Railway Stations, the Local Agents, or  
64, CORNHILL, LONDON.  
WILLIAM J. VIAN, Secretary.

DEBILITY AND NERVOUSNESS.  
Free Edition, 12 pages, post free, in envelope, two stamps. The  
**WARNING VOICE**—A Special Medical Book for Young Men,  
on the Cause, Consequence, and Treatment of certain forms of Debility  
and Nervousness, viz.—Mental and Physical Depression, Palpitation of the Heart,  
Noises in the Head and Ears, Impaired Sight and Memory, Indigestion, Pains in  
the Back, Headache, Piles, Constipation, Hysteria, Dizziness, Local Weakness,  
Muscular Relaxation, Nervous Irritability, Blushing, &c., resulting from Exhaustion  
of Nerve Power, effect of Overwork, City Life, Worry, Brain Toll, Intemperance, and other abuses of the system.  
Address, Dr. H. SMITH, 8, Burton Crescent, London, W.C.



**SHOLL'S PATENT DIRECT-ACTING  
PNEUMATIC STAMPERS,**  
For Pulverising Tin and Lead Ores, Gold Quartz, &c.,  
SOLE MAKERS FOR CORNWALL.

**N. HOLMAN AND SONS,**  
ST. JUST FOUNDRY, NEAR PENZANCE, CORNWALL.

All objectionable features of "wear and tear" common to the original and existing Pneumatic Stamps (driven by belts) are removed in this patent, and leather glands and stuffing boxes entirely dispensed with, the pneumatic piston being reciprocated into the compressing chambers by direct-action from without. These double machines are guaranteed to be of the capacity of 36 ordinary heads of cam and lifter stamps, and engineers will at once see that, inasmuch as the power is directly applied to its work (without the medium of belts and other gearing), the minimum consumption of coal (all other conditions being equal) must be the result.

The COST OF THESE MACHINES (including boiler) is about ONE-THIRD OF THE ORIGINAL CAM AND LIFTER STAMPS, to do the same work.

ROTARY STAMPERS SUPPLIED ON THE SAME PRINCIPLE, WITHOUT STUFFING BOXES OR GLANDS, WHERE RUNNING GEAR EXISTS, OR WITH HORIZONTAL CONDENSING ENGINES AND BELTS TO DRIVE THEM, IF PREFERRED.

Also, SOLE MAKERS OF STEPHENS' PATENT PULVERISER.  
MINING AND OTHER MACHINERY CONSTANTLY ON SALE,  
NEW AND SECOND-HAND.

**The "BURLEIGH" ROCK-BORING COMPANY**  
(L I M I T E D ),

**100, KING STREET, MANCHESTER.**

RICHARD MOTTRAM, Secretary.

For the Sale of the "Burleigh" Rock Boring Machinery, and also for Sinking Shafts, Cutting Tunnels and Levels, and General Rock Blasting Operations by Contract.

References permitted to—

Messrs. BOLCKOW, VAUGHAN, AND CO. (LIMITED), Middlesborough.

" THE DOWLAIIS IRON COMPANY (LIMITED), South Wales.

" THE EBBW VALE STEEL, IRON, AND COAL COMPANY (LIMITED), South Wales.

" THE CRUMLIN VIADUCT WORKS COMPANY (LIMITED), South Wales.

" T. T. J. WALLER, Esq., Railway Contractor, Gisburn, near Skipton.

" TURNER AND SON, Limestone Quarries, Kiverton Park, near Sheffield.

" THE CLIFTON AND KERSLEY COAL COMPANY, near Manchester.

" THE ST. BRIDE'S WELSH SLATE AND SLAB COMPANY, Haverfordwest.

" THE WARTON LAND COMPANY (LIMITED), Silverdale, near Carnforth.

" THE MONTIPONI SOCIETY, Turin, Italy.

The following letter has recently been received from the Ebbw Vale Company:—  
GENTLEMEN.—I have much pleasure in stating that in the execution of your contract to drive, for the Ebbw Vale Steel, Coal, and Iron Company (Limited), a cross measure Drift from the Old Coal to the Rock Vein Coal, in the Glyn Pits, at Pontypool, you did so with dispatch, and to the entire satisfaction of all concerned. The distance driven was 453 yards in about 13 months. Yours faithfully, ROBERT JORDAN, Mining Engineer, Ebbw Vale Company's Collieries and Mines.

[The size of the above heading is 9 ft. by 18 ft.]

The "Burleigh" Machinery can be seen in operation at Manchester any time, by giving a few days' notice to the company.

BROADBENT'S

**Patent Improved Blake Stone Breakers.**

GUARANTEED NO INFRINGEMENT OF ANY PATENT.

**AWARDED PRIZE MEDAL,**

In competition with the best-known Stone Breakers,

September 7th, 1876.

Formerly Manufacturers for the late H. R. Marsden, having made for him in less than four years 336 Stone Breakers.

ESTABLISHED 1836.

Prices and particulars on application to the Patentees and Sole Makers,

**ROBT. BROADBENT AND SON, STALYBRIDGE.**

**THOMAS TURTON AND SONS,**

MANUFACTURERS OF

MINING STEEL of every description.

CAST STEEL FOR TOOLS. CHISEL, SHEAR, BLISTER, & SPRING STEEL  
MINING TOOLS & FILES of superior quality.

EDGE TOOLS, HAMMERS, PICKS, and all kinds of TOOLS for RAILWAYS, ENGINEERS, CONTRACTORS, and PLATELAYERS.  
LOCOMOTIVE ENGINE, RAILWAY CARRIAGE and WAGON SPRINGS and BUFFERS.

**SHEAF WORKS & SPRING WORKS, SHEFFIELD.**

LONDON OFFICES.—90 CANNON STREET, E.C. PARIS DEPOT—12, RUE DES ARCHIVES.

NEW YORK STORE—102, JOHN STREET.

# NOBEL'S DYNAMITE

MANUFACTURED AND SOLD BY

**NOBEL'S EXPLOSIVES COMPANY (LIMITED), 149, West George Street, Glasgow.**

Supplies may be obtained from any of the following Agents of the Company in Great Britain:—

HENRY KITCHIN and Co., 14, Tangier-street, Whitehaven.  
P. H. EDWARDS, Forth House, Newcastle-on-Tyne.  
FANSON, ARMSTRONG, and Co., Middlesbrough-on-Tees.  
ALBERT RICKETTS, Dean-lane, Bedminster, Bristol.  
B. READ, Reforme, Portland, Dorsetshire.  
LEIGH and SILLAVAN, Barton House, 66, Deansgate, Manchester.  
GEORGE ROBERTS, George-street, Gloucester.  
J. H. BEAN and Co., 6 Albion-street, Leeds.  
WM. RICH and SONS, 4, Basset-street, Redruth, Cornwall.  
CROSS BROTHERS, 21, Working-street, Cardiff.  
G. WILLIAMS and SON, Baker-street, Aberystwith.  
WEBB and Co., Llanberis, Caernarvon.

J. T. EACHUS, Holywell.  
JOHNSON and Co., Tower-street, Dudley.  
TODHUNTER and ELLIOT, Market-place, Douglas, Isle of Man.  
ROBERT HAMILTON, 30, Hanover-street, Edinburgh.  
JOHN DONALD, 4, Belmont-street, Aberdeen.  
WILLIAM WATSON, Sunnyside-road, Coatbridge.  
ROBERT HAMILTON, Douglas-street, Dunfermline.  
JOHN D. M'JANNET, Park-place, Sterling.  
CHARLES CUNNINGHAM, 81, Murraygate, Dundee.  
R. and J. CARSON, 8 and 10, Corn Market, Belfast.  
CLOHERY and SEMPLE, Merchants' Road, Galway.  
COOKE BROTHERS, 67, Patrick-street, Cork.

LONDON AND EXPORT AGENTS:

J. and G. THORNE and CO., 85, GRACECHURCH STREET, LONDON, E.C.  
FACTORIES—ARDEER WORKS, STEVENSTON, AYRSHIRE.  
WESTQUARTER WORKS, POLMONT STATION, STIRLINGSHIRE.

## TONITE, OR COTTON POWDER. THE SAFEST, CHEAPEST, AND STRONGEST OF ALL EXPLOSIVES.

RECOMMENDED TO MINERS, PIT SINKERS, QUARRYMEN AND CONTRACTORS  
AS THE MOST EFFICIENT AND ECONOMICAL BLASTING AGENT EVER INVENTED.

OFFICES:

**23, QUEEN ANNE'S GATE, LONDON, S.W.**

Agents: DINEEN, SON, and Co., Leeds; JOHN RUSSELL, Whitehaven; R. J. CUNNACK, Helston, Cornwall; J. and W. SMITH, Chapel-en-le-Frith; W. VEITCH, Jedburgh, N.B.

## PATENT DETONATORS.

### FIRST-CLASS DETONATORS MANUFACTURED FOR THE TRADE ON

THE MOST FAVOURABLE TERMS.

Apply to—

The COTTON POWDER COMPANY (Limited), 23, Queen Anne's Gate, London, S.W.

## LITHOFRACTEUR.

THE BEST EXPLOSIVE KNOWN FOR EVERY KIND OF QUARRYING, MINING, TUNNELLING, AND SUBAQUEOUS OPERATIONS.

UNRIVALLED FOR STRENGTH, SAFETY, AND FREEDOM FROM GASES.  
EXPORT ORDERS DELIVERED FREE ON BOARD IN THE THAMES. PAMPHLETS ON APPLICATION.

Responsible Agents for the Country Districts can apply to—

**KREBS BROTHERS AND CO., Sole Manufacturers and Patentees,  
22, BASINGHALL STREET, LONDON, E.C.**

W. J. SEYD, Agent

**DARLINGTON ROCK DRILLS, AIR COMPRESSORS, SINKING AND DRIVING APPARATUS.**

**ELECTRIC FUSES, FIRING MACHINES, CABLES, INSULATORS, &c.**

**DETONATORS. DOUBLE, TREBLE, QUINTUPLE, SIXTUPLE, &c.**

**DYNAMITE. STRONGEST QUALITY. EXPORT ORDERS EXECUTED.**

Apply to—

**JOHN DARLINGTON, 2, COLEMAN STREET BUILDINGS,  
MOORGATE STREET, LONDON.**

## CLAYTON AND SHUTTLEWORTH'S

### NEW CATALOGUE, No. 78.

WITH REVISED LIST OF PRICES OF

## PORTABLE ENGINES AND THRESHING MACHINES,

WITH OR WITHOUT PATENT COMBINED GUARD AND FEEDER.

Traction Engines. Steam Elevators and Stackers.

Horizontal Fixed Engines. Circular Saws. Corn Mills, &amp;c., &amp;c.

CAN BE OBTAINED, POST FREE, ON APPLICATION TO

## CLAYTON & SHUTTLEWORTH, Lincoln;

78, LOMBARD STREET, LONDON;  
AND 35 AND 37, TARLETON STREET, LIVERPOOL.

British and Foreign Safety Fuse Company,  
REDRUTH, CORNWALL,

MANUFACTURERS OF

## SAFETY FUSE, FOR MINING AND QUARRYING PURPOSES.

PRICES ON APPLICATION



## "Kainotomon" Rock Drill

SELECTED BY THE

BRITISH, PRUSSIAN, &amp; SAXON GOVERNMENTS.

SUPERIOR  
Air-Compressors, Coal-  
Cutters, Pumps, and all  
Mining Machinery.



SECONDHAND ROCK DRILLS  
BRYDON AND DAVIDSON'S  
make £25 each new £32

**T. A. WARRINGTON,**  
**30, King-street, Cheapside,**  
**LONDON E.C.**

## JOHN TAYLOR & CO.,

MANUFACTURERS OF

Single and Double Leather  
Machine Belting.  
Copper Riveted Leather Hose  
Pipes.  
India Rubber Valves, Sheet,  
Washers, Belting, Hose Pipes, Packing, &c., &c.  
Gutta Percha Pump Buckets,  
Round and Flat Bands, Tube, Sheet, &c., &c.  
Brattice Cloth, Roofing and Hair  
Felt.  
Harness Leather, Engine Bends,  
Hippopotamus and Walrus Hides, and every description of  
Leather used in Collieries and Mines.  
Warehouse: 12, Dean-street, Newcastle-on-Tyne.  
Works: Dean Court, ditto

## CRAVEN AND SPEEDING BROS.,

MANUFACTURERS OF EVERY DESCRIPTION OF

### WIRE AND HEMP ROPES

FOR

COLLIERIES, RAILWAYS AND SHIPPING, &c.,  
Charcoal and Steel Wire Ropes (Flat and Round), of best  
selected Charcoal and Steel Wire.

Guide Rods.

Galvanised Wire Signal Cord.

Galvanised and Plain Strand for Fencing.

Galvanised Wire Rope for Ships' Rigging.

Chains, Wire Rope Pulleys, Brattice Cloth, &amp;c., &amp;c.

Hemp Crab Ropes, of best selected Petersburg and Italian Hemp  
Ditto Flat Ropes ditto ditto  
Ditto Cordage ditto ditto

Manilla Rope, White and Tarred.

Flax Spun Yarn and Dressed Flax, for Packing.

Brown and White Spun Yarn.

Fine Dressed Petersburg and Italian Hemp, &amp;c., &amp;c.

Ships Rigging fitted to order. Estimates and special quotations  
supplied on application to

## CRAVEN & SPEEDING BROS.

Wear Hemp and Wire Rope Works,  
SUNDERLAND.

By a special method of preparation, this leather is made solid, perfectly close in  
texture, and impermeable to water; it has, therefore, all the qualifications essen-  
tial for pump buckets, and is the most durable material of which they can be made.  
It may be had of all dealers in leather, and of—

HEPBURN AND GALE,  
TANNERS AND CURRIERS, LEATHER MILLBAND AND HOSE PIPE  
MANUFACTURERS,  
LONG LANE, SOUTHWAKE, LONDON  
Prize Medals, 1851, 1855, 1862, for  
MILL BANDS, HOSE, AND LEATHER FOR MACHINERY PURPOSES.

Just published, cloth limp, price 1s. 6d.,  
THE COLLIERY READY-RECKONER AND WAGES  
CALCULATOR,  
By JAMES IRELAND.

"Will be the means of preventing many disputes between pay clerks and  
collievers."—*Mining Journal.*  
To be had on application at the MINING JOURNAL Office, 26, Fleet-street, E.C.

MAPS OF THE MINES, AND OF UTAH TERRITORY.

FROISETH'S NEW AND REVISED MAP FOR 1875.—  
Size 40 by 66 inches, scale 8 miles to the inch. Handsomely engraved, col-  
oured in counties, showing the Towns, Settlements, Rivers, Lakes, Railroads,  
Mining Districts, &c., throughout the Territory, and all the Government Survey-  
to date. Mounted on cloth, 2s; half-mounted, 2s 12s.; pocket form, 6s.

Also, GENERAL MINING MAP OF UTAH, showing twenty-eight of the  
principal Mining Districts adjacent to Salt Lake City, and location of the most pro-  
minent mines. Price, pocket form, 6s.

Also, NEW MAP OF LITTLE AND BIG COTTONWOOD MINING DIS-  
TRICTS, showing the location of over Four Hundred Mines and Tunnel Sites, to  
gether with the Mines Surveyed for United States Patent. Price, sheets, 6s.; po-  
cket form, 6s.

For sale, and supplied by—  
TRUBNER and CO., 57 and 59, Ludgate Hill, London; or

B. A. M. FROISETH, Salt Lake City, Utah, U.S.

## THE MINING SHARE LIST.

## BRITISH DIVIDEND MINES.

Shares	Mines	Paid.	Last wk.	Clos. pr.	Total divs.	Fresh.	Last insd.
4000 Brookwood, c, Buckfastleigh	1 16 0	-	1	% 1	3 16 0	0 2 0	Nov. 1878
2000 Bryn Alyn, *l, Denbigh	10 0 0	-	-	-	0 7 0 0	0 7 0	Jan. 1877
10000 Caron, l, Cardigan*	2 0 0	-	2 1/2	2 2/4	0 4 0 0	0 2 0	Oct. 1878
10000 Cram, Brea, c, Illogan†	55 7 6	30	30	30 2/4	808 0 0	1 0 0	Aug. 1878
400 ashwell l, Cumberland*	2 10 0	-	-	-	1 9 5 0	0 2 0	Aug. 1878
2450 Cook's Kitchen, l, Illogan†	24 14 9	-	3 1/2	3 1/2	11 17 0	0 7 6	Jan. 1877
10240 Devon Gt. Consols, c, Tavistock*	1 0 0	-	1 1/4	1 1/4	118 18 0	0 5 0	July 1877
4296 Dolcoath, c, t, Camborne	10 14 10	23	23	23 2/4	112 18 3	0 5 0	Aug. 1878
5000 East Black Craig, l, Scotland	5 0 0	-	-	-	0 10 0 0	0 10 0	Aug. 1878
200 East Barre, t, Cardiganshire	82 0 0	-	-	-	236 10 0	1 0	Aug. 1876
6000 East Pool, t, Illogan	0 9 9	-	-	-	15 11 9 0	0 2 6	Aug. 1878
40300 Glasgow Carb., *l, 30,000 £1 p., 10,000 15 p.,	1	-	3 1/2	3 1/2	0 13 10 0	0 6 0	Aug. 1878
7500 Gorssed and Merlin Cons., l, Flint 2 10 0	4 1/2	8 1/2	8 1/2	8 1/2	0 5 0 0	0 5 0	Aug. 1877
5000 Great Laxey, l, Isle of Man†	4 0 0	16	16	16 1/2	24 5 0	0 6 0	Oct. 1878
615 Gt. Retallack, l, b, Perranzabuloe	5 18 6	-	-	-	0 1 6 0	0 1 6	May 1878
6400 Green Hurth, l, Durham	0 6 0	-	1	1	1 18 0	0 3 0	Mar. 1878
20000 Grogwinion, l, Cardigan*	2 0 0	-	3 1/2	3 1/2	0 14 10 0	0 10 0	Aug. 1878
9830 Gunnislake (Clitters), t, e	5 8 0	-	2 1/2	2 1/2	0 12 9 0	0 0 0	Oct. 1876
8000 Holmush, c, s-l, Callington*	1 0 0	-	-	-	0 4 6 0	0 0 0	Sept. 1878
2800 Isle of Man, l, Isle of Man†	26 0 0	-	-	-	82 8 0	0 0 0	Feb. 1876
20000 Leadhills, l, Lanarkshire	6 0 0	-	2 1/2	2 1/2	0 15 0 0	0 3 0	Mar. 1878
10000 Llanidloes, l, Cardiganshire	18 15 0	50	40	50	586 10 0	1 1/2	May 1878
14000 Llanidloes, l, Montgomery	3 0 0	-	-	-	0 9 0 0	0 4 6	Nov. 1876
3000 Marke Valley, c, Linkinhorne	5 3 8	-	3 1/2	3 1/2	7 15 0	0 2 0	Jan. 1876
10000 Mellanor Copper, Hayle*	2 0 0	-	3 1/2	3 1/2	0 5 0 0	0 3 0	July 1878
30000 Minera Mining Co., t, Wrexham	5 0 0	8	8 10	8 10	67 15 8	0 2 6	Sept. 1878
20000 Mining Co. of Ireland, c, l, l*	7 0 0	-	-	-	23 17 8	0 2 6	Jan. 1878
444 North Busy, c, Chacewater	3 9 8	-	-	-	1 10 0	1 0 0	July 1877
16289 North Hendre, l, Wales	2 1 0	-	-	-	2 7 3	0 5 0	June 1878
8000 Panty Mwyn, l, Mold (8794 iss.)	2 0 0	-	5 1/2	5 1/2	0 3 0 0	0 2 0	Aug. 1878
5000 Penhalls, t, St. Agnes	2 8 6	-	1	1	0 9 0 0	0 9 0	June 1877
6000 Pennant, l, bar, North Wales*	5 0 0	-	4 1/2	4 1/2	0 10 0	0 5 0	Mar. 1878
45793 Penstruthal, t, c, Gwennap	2 0 0	-	3 1/2	3 1/2	0 2 8 0	0 8 0	Nov. 1875
14000 Prince Patrick, *s-l, Holywell	1 0 0	-	1 1/2	1 1/2	0 14 0 0	0 1 3	Jan. 1876
10000 Red Rock, *s-l, Cardigan	2 0 0	-	2 1/2	2 1/2	0 4 0 0	0 2 0	Jan. 1878
10000 Roman Gravels, t, salop*	7 10 0	-	6 1/2	6 1/2	7 15 0	0 5 0	Mar. 1874
512 South Cadron, c, St. Cleer	1 5 0	55	50 60	743 10 0	1 0	0 0 0	Sept. 1878
5123 South Condorrows, t, Camborne	8 8 8	10 1/2	10 1/2	10 1/2	4 1 0	0 8 0	Aug. 1878
12000 St. Harmon, *l, Monmouth	3 0 0	3	2 1/2	3	0 12 0	0 3 0	July 1878
10000 no. Fr. Patrick, *s-l, (8000 sh. issued)	1 0 0	-	-	-	0 7 0	0 1 0	Oct. 1875
14500 South Wh. Frances, t, Illogan†	7 12 4	4 1/2	4 1/2	4 1/2	37 5 0	0 5 0	Sept. 1878
12000 Tamar, l, Salop	6 0 0	-	4 1/2	4 1/2	4 17 0	0 5 0	Dec. 1878
6000 Timcroft, c, t, Pool, Illogan†	11 10 0	6	6 7	6 7	50 8 0	0 5 0	May 1878
15000 Van, l, Llanidloes*	4 5 0	17	15 16	23 5 6	0 5 0	Oct. 1874	
2000 W. Oliverton, l, Perranzabuloe	12 10 0	-	3 1/2	3 1/2	55 10 0	0 10 0	Feb. 1878
1783 West Poldice, St. Day	10 0 0	-	-	-	1 19 0	0 0 0	July 1878
512 West Tolgas, c, Redruth	95 10 0	47 1/2	42 44	31 0	0 0 0	1 5 0	Sept. 1878
2048 West Wheal Frances, t, Illogan	28 8 9	1 1/2	1 1/2	1 1/2	3 12 8	0 8 0	Aug. 1878
6000 West Wheal Seton, c, Camborne	47 0 0	9	8 8	8 8	44 6 0	0 15 0	Apr. 1878
12000 West Wye Valley, t, Montgomey	8 0 0	-	2 1/2	2 1/2	0 12 0	0 3 0	Nov. 1877
1024 Wh. Eliza Consols, t, St. Austell	18 0 0	-	1 1/2	1 1/2	19 10 0	1 12 0	Aug. 1878
2048 Wheat Kitty, t, St. Agnes	4 3 10	5 8 0	3 1/2	3 1/2	8 5 0	0 5 0	July 1878
25000 W. Newton, c, t, Salop*	1 0 0	-	-	-	11 19 6	0 2 8	Dec. 1874
80000 Wheat Owes, t, St. Just	161 5 0	20	15 20	52 10 0	0 0 0	0 0 0	Aug. 1872
3000 Wheat Peavor, t, Redruth	7 11 0	6 1/2	6 1/2	6 1/2	0 10 0	0 5 0	Aug. 1878
91000 Wye Valley, t, Montgomey	8 0 0	-	-	-	0 4 0 0	1 0 0	July 1877
10000 Wye Valley, t, Montgomey*	8 0 0	-	2 1/2	2 1/2	0 10 6	0 4 0	Oct. 1878

## FOREIGN DIVIDEND MINES.

Shares	Mines	Paid.	Last Pr.	Clos. Pr.	Last Call.		
35500 Alamillos, l, Spain†	2 0 0	-	1 1/2	1 1/2	1 19 0	0 0 6	Oct. 1878
30000 Almada and Trito Consol., *s-l	1 0 0	-	5 1/2	5 1/2	0 6 3	0 1 0	May 1878
20000 Australian, c, South Australiat	7 7 6	1 1/2	1 1/2	1 1/2	1 1 6	0 2 0	July 1878
10000 Battle Mountain, *c, (6240 part pd.)	5 0 0	-	-	-	0 10 0	0 10 0	Oct. 1878
10000 Birdseye Creek, g, California*	4 0 0	-	3 1/2	3 1/2	0 14 0	0 2 0	June 1878
20000 Capo Copper Mining, *s-l, Bo. Africa	7 0 0	30	23	23	32 5 0	0 6 8	Sept. 1878
34433 Cedar Creek, g, California*	8 0 0	-	3 1/2	3 1/2	0 8 0	0 2 4	June 1878
35000 Cesuna Sul. Co., Romagna, Italy*	10 0 0	-	-	-	0 18 0	0 2 0	Aug. 1878
18000 Chicago, t, Utah	10 0 0	-	1 1/2	1 1/2	3 2 8 0	0 6 0	Nov. 1878
65000 Colorado United, *s-l, Colorado*	8 0 0	-	2 1/2	2 1/2	0 13 0 0	0 15 0	Apr. 1878
10000 Copiapo, c, Chile (120 shares)	18 15 0	-	-	-	7 11 5 0	0 3 0	May 1878
100000 Pedro North del Rey†	0 16 0	-	3 1/2	3 1/2	2 8 9 0	0 2 0	Mar. 1872
23500 Eberhardt & Aurora, t, Nevada†	10 0 0	-	4	3 1/2	1 8 0 0	0 3 0	Dec. 1877
70000 English & Australian, *s-l, Aus.	2 10 0	-	1 1/2	1 1/2	2 15 9 0	0 1 0	Mar. 1878
80000 Flaggstaff, t, Utah	10 0 0	-	3 1/2	3 1/2	4 2 0 0	0 5 0	July 1878
25000 Fortune, t, Spain†	2 0 0	-	3 1/2	3 1/2	7 3 2 0	0 3 4	Oct. 1878
55000 Frontino & Bolivia, t, New Gran*	2 0 0	-	2 1/2	2 1/2	0 2 6 0	0 1 8	Sept. 1878
80000 Gold Run, hyd.	1 0 0	-	-	-	0 2 4 0	0 4 0	Oct. 1872
85000 Kapunda Mining Co. Australiat	1 3 0	-	-	-	0 2 4 0	0 6 0	June 1878
20000 Las Chance, t, Utah	5 0 0	-	3 1/2	3 1/2	0 14 0 0	0 2 0	July 1878
15000 Linarex, t, Spain†	3 0 0	-	3 1/2	3 1/2	17 10 4 0	0 2 6	Oct. 1878
65000 London and California, *s-l	2 0 0	-	4 1/2	4 1/2	0 1 0 0	0 1 0	July 1878
7837 Lusitanian, Portugal† (12 sh.)	8 10 0	-	-	-	1 11 6 0	0 1 6	Mar. 1878
5000 Mamm. Copperopolis of Utah, c	10 0 0	-	-	-	0 5 0 0	0 5 0	Dec. 1872
5000 Mountain Chief, t, Utah	10 0 0	-	-	-	0 4 0 0	0 4 0	Jan. 1878
10000 Pontigbald, *s-l, France	20 0 0	28	26 28	26 19 11	0 11 11	0 11 1 June	1878
100							